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VOLUME 124, No. 12 MARCH 20, 1947

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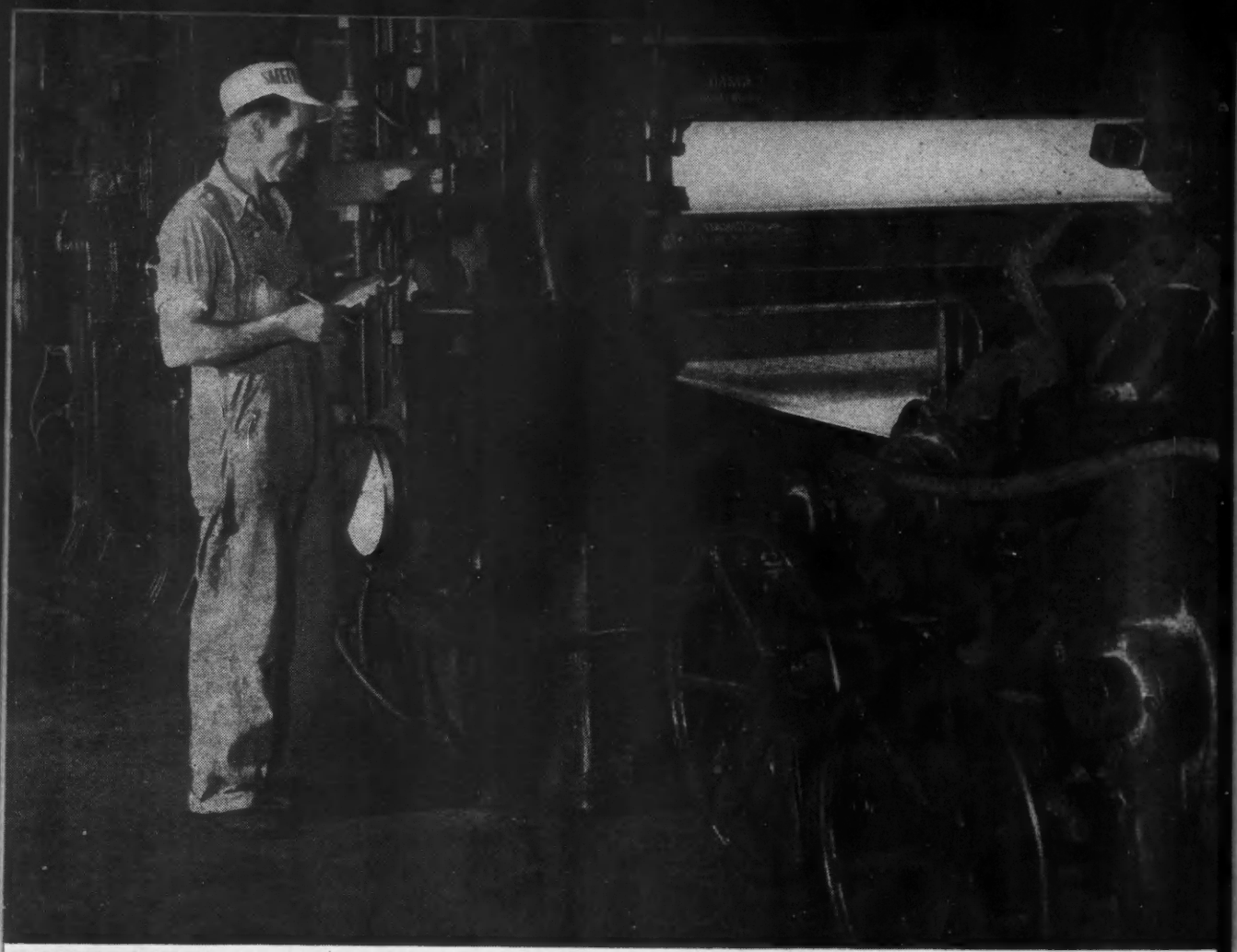
CALENDAR OF COMING EVENTS

March 31-April 1-2, 1947—National Paper Trade Association, Annual Convention, The Waldorf-Astoria, New York City.

April 10-11, 1947—National Paperboard Association, Meeting, Seaview Country Club, Absecon, N. J.

May 18-21, 1947—National Paper Box Association, Annual Convention, Hotel Traymore, Atlantic City, N. J.

May 22-24, 1947—American Pulp and Paper Mill Superintendents Association, Annual Convention, Edgewater Beach Hotel, Chicago.



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VOL. 124, NO. 12 MARCH 20, 1947

Newsprint Output At New February High

NEW YORK — Newsprint production in Canada during February amounted to 341,268 tons and shipments to 319,831 tons, according to the News Print Service Bureau. Production in the United States was 62,802 tons and shipments were 65,226 tons. The output in Newfoundland was 29,737 tons and shipments were 21,720 tons making a total North American production of 433,807 tons and shipments of 406,777 tons. Total production in February 1946 was 396,390 tons and shipments were 364,379 tons. North American production in February 1947 was greater than in any preceding February.

The Canadian mills produced 74,472 tons more in the first two months of 1947 than in the first two months of 1946, which was an increase of 11.7 percent. The output in the United States was 3,053 tons or 2.4 percent more than in the first two months of 1946; in Newfoundland production was 3,714 tons or 6.4 percent more, making a total increase of 81,239 tons, or 9.9 percent more than in the first two months of 1946, and also was higher than in any preceding similar period.

Stocks of news print paper at the end of February were 134,668 tons at Canadian mills, 11,936 tons at United States mills, and 76,041 tons at Newfoundland mills, making a combined total of 222,645 tons compared with 195,615 tons on January 31, 1947, and 189,894 tons at the end of February 1946.

Dobrow and Overton Tell Facts Before Cotton Rag Council

High Printing Costs Concern Chicago Paper Trade

CHICAGO—The Chicago paper trade is beginning to find cause for more worry, this time in an allied field. The printing industry in Chicago is reported to be plagued with alarmingly increased costs brought about through recent wage increases which are expected to add materially to the cost of printing. The trade feels that if the cost of printing goes too high it will cease to become a "necessity" and approach the "luxury" field. As one student of the paper and printing market observed, "There are lots of things people can still do and say without the use of paper. They can do it better with paper, it is true, but if the cost of the printing is too high they are certainly going to look elsewhere for the wherewithal to convey their message."

The market for paper continues very strong. There is no sign of any depression in prices but, on the other hand, a definite feeling exists that the paper trade has done an excellent job in keeping price boosts down to the 5 to 15 percent increase level. The trade honestly feels that it will reap genuine reward for its forbearance, both in reputation and in actual business.

CHICAGO — Materials supply problems, with considerable accent on rags and similar fibers, were examined in detail this week at the annual convention of the National Association of Waste Materials Dealers, Inc. A whole session was given over to the subject by the Cotton Rag Council of the Association. To this meeting M. C. Dobrow, executive secretary of the Writing Paper Manufacturers Association, and Carlton B. Overton, of Castle & Overton, Inc., brought summaries of the present situation and of the prospects for the near future, as viewed from the paper industry's position.

Mr. Overton, speaking as an importer, forecast a continued strong demand for materials from abroad, not only for woodpulp from Scandinavia, but for rags and cuttings. The largest tonnage users of rags, he declared, "are the roofing mills, and here there has been a development in the use of defibrated wood which has gone a long way toward solving the general question of supply. More waste papers are also being used by these mills with the result that whereas a large tonnage of domestic roofing rags will be needed it is doubtful that, except in periods of great activity, imported roofing rags will ever again be used as extensively as before the war.

"The need for foreign fibre rags and other old rags for papermaking uses will depend to a large extent upon domestic production which in turn will be affected primarily by labor conditions. New cuttings have never been important as imports.

"The collection and distribution of waste paper has been heavily accented during the war years with the result that greater tonnages are available than ever before, although at the moment there is no more than is needed, if indeed there is enough. Nevertheless, the likelihood of paper stock coming in from abroad seems rather remote as there is now and will continue to be a heavy demand for this material abroad.

"We come now to the second question; namely, what will be available from abroad? Shortage of coal in Sweden, wood in Norway and the practically complete destruction or tak-

(Continued on page 32)

N.P.T.A. Completes Convention Program

White & Wyckoff Reelect

HOLYOKE, Mass. — All officers and directors of White & Wyckoff Manufacturing Company have been reelected at the annual meeting of the stockholders held at the plant. The officers comprise Harry C. Dutton, president and general manager; Edward P. White, treasurer; Albert H. Sampson, assistant treasurer; Russell L. Davenport, clerk.

The directors reelected are Russell L. Davenport, Harry C. Dutton, William H. Hubbard, Stuart A. Russell and Edward P. White.

NEW YORK — A program of more than common interest has been completed for the forty-fourth annual convention of the National Paper Trade Association which gets under way on March 30 at the Waldorf-Astoria. On the afternoon of that day the Executive Committee will meet. A meeting devoted to twine will open Monday morning, to be followed by the general open meeting on Monday afternoon. Senator Styles Bridges, of New Hampshire, and Reuben B. Robertson, president of the American Paper and Pulp Association, will speak at this session. Tuesday has been set aside

(Continued on page 28)

Newsprint Use Rises Inventories Fall Off

NEW YORK — Daily newspapers reporting to the American Newspaper Publishers Association had stocks of newsprint in transit and on hand representing 32 days' supply at the end of February, 1947, which is a decrease of four days' supply compared with stocks on hand and in transit at the end of January, 1947. This supply of 32 days at the end of February compares with 35 days at the end of February, 1946; 50 days at the end of February, 1945; 42 days at the end of February, 1941.

Because of the bad transportation situation for newsprint, especially in Canada, it is emphasized that stocks of newsprint reported by member papers include considerable tonnage in transit and not in the city of publication at the end of the month.

Daily newspapers reporting to the ANPA consumed 258,424 tons of newsprint in February, 1947, compared with 223,244 tons in 1945 and 219,362 tons in 1941. This was an increase in February, 1947, over February, 1946, of 15.8 percent and an increase over February, 1941, of 17.8 percent.

The total estimated newsprint consumption in the United States for February, 1947, was 354,005 tons which includes all kinds of uses of newsprint. For the first two months in 1947 it is estimated to be 718,967 tons. During the first two months of 1947 the reporting newspapers used 524,846 tons of newsprint, an increase of 18.1 percent over the first two months of 1946 and an increase of 16.9 percent over the first two months of 1941.

Paper Mill Men Meet In Los Angeles

LOS ANGELES—Sixty members of the Southern California Paper Mill Men's Club attended the noon luncheon at the Mayfair hotel. In a short business meeting Jack Leiser, manager of Pioneer Wrapper Company, Los Angeles, was elected treasurer of the club, succeeding Ben Bahnsen.

Following the business meeting, the club was entertained by Tony Caboosh, humorist of radio and screen fame. Tony discussed the relationships between the Americas.

John Kirby, of Kirby Sales, Los Angeles, was chairman in charge of the meeting. President Newby Green, of Crown-Willamette Paper Company, presided.

F. J. McCourt Heads Hudson Valley Group

CORINTH, N. Y.—The annual meeting of the Hudson River Mill Technical Association held last week resulted in the election of F. J. McCourt as president to succeed D. C. Lincoln. Other officers chosen were: H. T. Burns, vice-president; H. D. Bush, treasurer; G. W. Holland, secretary; W. F. Curtis, chairman of educational committee; C. A. Duell, chairman of entertainment committee; J. T. Murphy, chairman of membership committee. President McCourt praised the work of the retiring administration and expressed the hope that the ensuing year might be as successful as the previous years. Following the business session, James Walker, superintendent of the Palmer plant of the International Paper Co., presented an address with illustrated sketches.

Eastern Tablet Plans $700,000 Construction

COHOES, N. Y. — Further expansion of the paper industry of the Mohawk Valley is reflected in the disclosure by the Eastern Tablet Co. of plans for construction of new additions at its Albany property which will cost about $700,000. The present property consists of a small building for office purposes and two larger structures adjoining each other in the rear. The proposed plans call for erection of two concrete and steel structures, two stories high, which will extend several hundred feet in the back to the railroad of the Delaware & Hudson. A spur branch serving the plant is to be relocated.

The plans indicate that the office layout in front of the new consolidated plant will be extensive. The space in the rear is to be used for storage and shipment of finished quantities of writing tablets, the principal product of the firm. The decision to expand is understood to have been made because of the rapidly increased business which has taxed the capacity of the plant to its fullest extent for some time.

St. Regis Awards 25-Year Pins To Nine at Toledo Plant

TOLEDO, Ohio — The Toledo multiwall paper bag plant of the St. Regis Paper Company held a testimonial dinner March 7 for nine of its employes who have served the company twenty-five years or more. A total of 256 years' service was represented by the group.

Each of the employes was presented with a Certificate of Award for Loyalty and Service and a 25-year pin. Telegrams of congratulations were received from Roy K. Ferguson, president of St. Regis; E. R. Gay, vice-president; W. E. Hahn, in charge of multiwall bag production in all plants; and Alex Smalley, labor relations advisor to Mr. Ferguson.

The names of the employes and their years of service follow: Albert Flick, 34 years; Frank L. Plush, 30 years; Curl Thompson, 30 years; Mollie Spencley, 29 years; John H. Deacon, 27 years; Edson Frantz, 27 years; Albert Hauser, 27 years; Arthur G. Hartman, 27 years; Grace Wood, 25 years.

Congress Opens Bids For Second Quarter

WASHINGTON — Bids were received on Monday by the Joint Congressional Committee on Printing for paper for the use of the Government Printing Office for a three months' period beginning April 1, 1947. Awards are to be announced Monday, March 24th. The bids were as follows:

Newsprint

No. 1—2,400,000 lbs., 24x36—64; rolls, 19, 24, 36, and 48 ins. wide (3-inch fiber cores). Weight of cores and wrappers shall be included in net weight.

Machine-Finish Book

No. 3—50,000 lbs., 25x38—70; flat, cut any size, min. 21 ins., max. 48 ins.
Mudge Paper Co. 10.16c
Barton, Duer & Koch Paper Co. (Price at time of shipment) 10.44c

No. 4—300,000 lbs., 25x38—70; flat, cut 24x38, 28x38, and 38x48 ins.
Mudge Paper Co. (150,000 lbs. only) 10.16c

No. 5—300,000 lbs., 25x38—70; flat, cut 24x38, 28x38, and 38x48 ins.
Mudge Paper Co. (100,000 lbs. only) 10.16c

No. 9—500,000 lbs., 25x38—70; rolls, 24, 36, and 48 ins. wide. (3-inch fiber cores).
Mudge Paper Co. 9.31c
Mead Sales Co. (300,000 lbs. only) 9.60c
Barton, Duer & Koch Paper Co. (Price at time of shipment. 250,000 lbs. only) 9.56c

No. 10—50,000 lbs., English finish, 25x38—90; flat, cut any size, min. width 24 ins., max. width 48 ins.

Offset Book

No. 19—50,000 lbs., 25x38—80; flat, cut any size, min. width 24 ins., max. width 48 ins., the grain to run lengthwise of the sheet.

No. 20— 750,000 lbs., 25x38—100; flat, cut any size, min. width 24 ins., max. width 48 ins., the grain to run lengthwise of the sheet.
Franklin Research Co. (500,000 lbs. only.) 12.50c

Offset Poster

No. 21—250,000 lbs., 25x38—120; flat, cut any size, min. width 24 ins., max. width 48 ins., to run lengthwise of the sheet.

Antique Book

No. 22—50,000 lbs., 25x38—90; and 120; flat, cut 32x42, 33x43, and 38x50 ins.
Mead Sales Co. 9.56c

50% Laid Antique Book

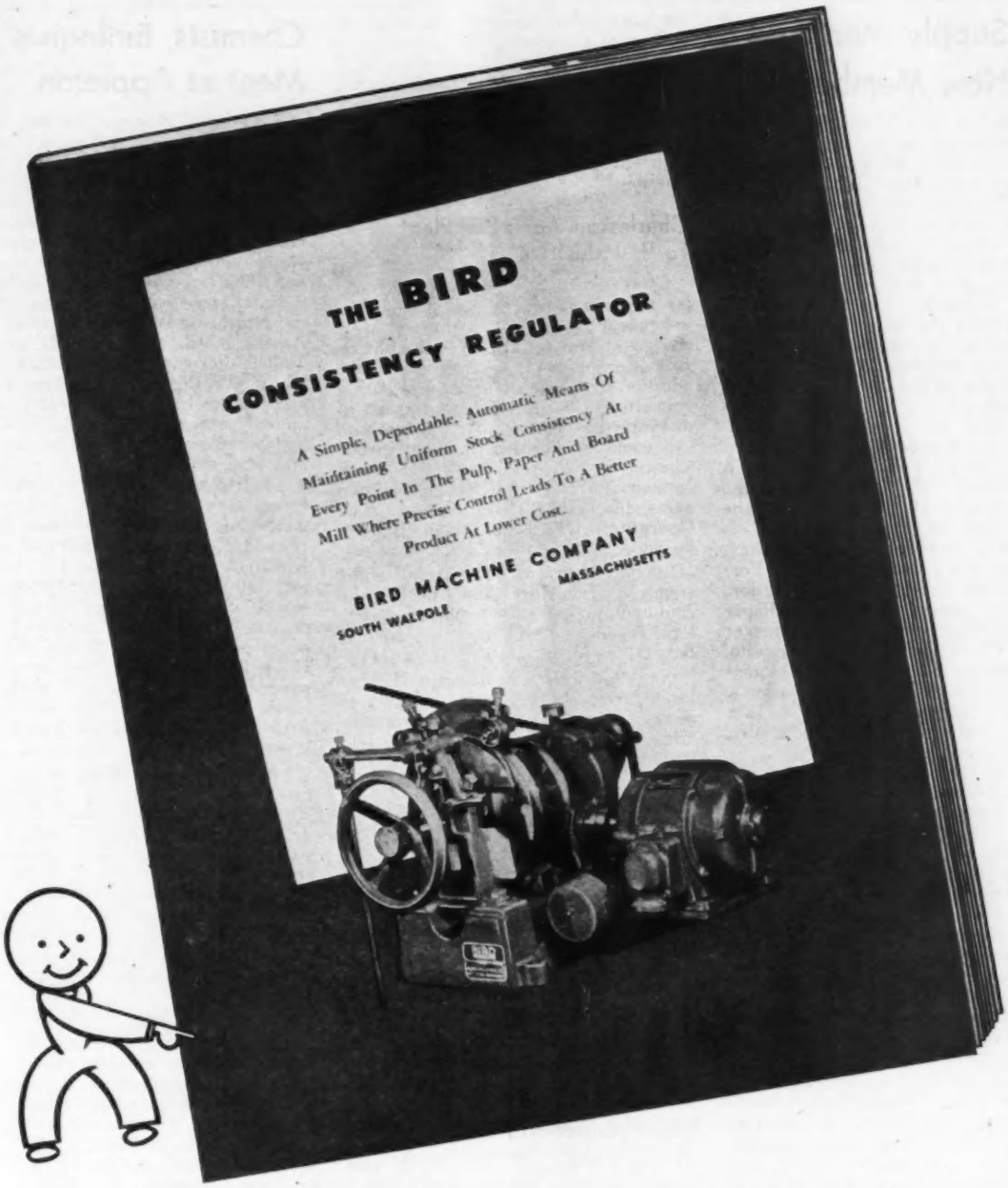
No. 29—80,000 lbs., 25x38—140; flat, cut 38x48 ins.; the laid marks to run the 38-inch direction of the sheet; the grain and chain marks to run lengthwise of the sheet.

Supercalendered Book

No. 33—450,000 lbs., 25x38—90; flat, cut any size, min. width 24 ins., max. width 48 ins.

No. 34—800,000 lbs., 25x38—90; rolls, 28½ and 38 ins. wide. (3-inch fiber cores).
Mead Sales Co. (400,000 lbs. only) 9.40c
R. P. Andrews Paper Co. 8.58c

(Continued on page 34)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Mill Supply Men Add Ten New Members

BOSTON — Ten waste paper firms from Greater Boston became new members of the Eastern Paper Mill Suppliers Association, Inc., at a meeting held at the Hotel Kenmore, March 11. The organization, which was formed about a year ago, with headquarters in Connecticut, and president and secretaries in Hartford and New Haven, respectively, arranged for the meeting with the object of increasing the membership. About 50 dealers, brokers and packers attended. Previous membership included about 25 from New England.

A speaker was Joseph Cohen, president of the Boston Chapter, *Iron Institute*, who gave a talk on organization. Herbert A. Lindenberg, of the Commercial Bulletin, discussed the same subject briefly.

The new members are D. De Stefano & Company, Inc., Boston; Sy Forman, Brookline; Graham Corporation, Roxbury; James J. Graham Paper Company, Cambridge; Philip Krasker & Son, Chelsea; Luper & Thompson, Charlestown; Norfolk Waste Paper Company, Inc., Walpole; P. Shaffer & Co., Inc., Chelsea; Stein & Co., Inc., Chelsea; and W. Rubenstein & Co., Inc., Chelsea.

The objects of the Association are "to organize the waste paper industry of New England into a trade organization to meet the needs of this industry, its employees, and of the public generally, to obtain a fair return for the services performed by its members, to improve labor conditions, and to promote the welfare of its employees; to eliminate grievances and cause for complaint among its members; to inform the public and to obtain for the benefit of all members full publicity with respect to general conditions prevailing in this industry.

Officers of the organization are: President, Percy Stone, Lamson Supply Company, Hartford, Conn.; vice-presidents, Julius Kimball, Kimball Paper Stock Company, Holyoke, Mass.; Norman Alper, M. S. Alper & Son, Providence, R. I.; Max Cohen, Dave Mill Supply, New Haven, Conn.; Maurice Kurn, Springfield, Mass.; Jacob Moiger, Capital Square Iron & Paper Company, Hartford, Conn.; Jack Shuman, Braver Healy & Company, Inc., Roxbury, Mass.; recording secretary, Maurice Marcus, Marcus Paper Company, New Haven, Conn.; corresponding secretary, Charles Andolino, Dave Mill Supply Company; treasurer, Sidney Albert, Albert Brothers, Waterbury, Conn.; assistant treasurer, Maurice Marcus.

J. Anton de Hass To Address Boston Paper Trade

BOSTON — Dr. J. Anton de Haas, professor of International Relationships, Harvard Graduate School of Business Administration, international author and lecturer, and member of the Foreign Policy Association, is to be the speaker at the annual meeting and dinner of the Boston Paper Trade Association in the Roof Ballroom of the Parker House, March 19. His subject will be "Is Economic Cooperation Possible?"

Charleston Adds Box Plant To Its Industries

CHARLESTON, S. C.—Rufus C. Barkley, chairman of the Charleston Development Board, and Arthur N. Morris, president of the Newth-Morris Box Corporation, have disclosed the addition of a paper box manufacturing concern to Charleston's growing list of diversified industries. Mr. Morris said the company has leased about 16,000 square feet of floor space at Stark Industrial Park and has taken two acres adjacent for future expansion. Operations will begin about June 1, he added.

"While paper is in extreme short supply," Mr. Morris continued, "the company hopes to be able to supply local needs on set-up and folding boxes."

Newth-Morris Box Company has its headquarters in Baltimore, where two plants are operating, and also maintains plants in Nashville, Tenn.; Orlando, Fla., and two in Jacksonville, Fla. Charleston will be the fifth city and seventh plant.

According to Mr. Morris, Eugene Corrigan will be transferred from the company's New York sales office to manage the Charleston plant. He will arrive here about May 1 to supervise installation of machinery and take applications for employment.

Between 75 and 100 persons will be employed at the beginning. The operation will represent an initial capital outlay of about $100,000, it was estimated.

Sandy Hill To Hold High Production Rate

HUDSON FALLS, N. Y. — Sandy Hill Iron and Brass Works plans a high rate of production during the postwar period. The company has set a goal which calls for more than one paper machine dryer a day, more than a "Packer" screen a day and more than a Hypoid corner drive a day. An official claims that this production is being achieved in spite of material shortage, inability of customers to accept machine deliveries because of delays in building programs and the inevitable inefficiencies which arise when any great comprehensive program is being carried out.

During the war the firm was requested by the Government to increase production from a winch every two days to one a day, which was a tremendous jump from the period of several weeks required to turn out the first large winch at the plant.

Chemists, Biologists Meet at Appleton

APPLETON, Wis. — Chemists, microbiologists and technical representatives of the paper industry will hold an all-day meeting Thursday, March 20, at the Institute of Paper Chemistry in this city. They will hear reports by recognized authorities on recent advances in the chemistry of enzymes and their reactions.

Joint sponsors of the meeting are the Northeast Wisconsin section of the American Chemical Society and the Valley Microbiological Association. Dr. Ward W. Pigman, a member of the staff at the Institute and editor of the annual review, "Advances in Carbohydrate Chemistry," will be the general chairman.

The morning session, of special interest to microbiologists, will include papers on respiratory enzymes by Dr. Harold Koepsell, enzymologist at the Northern Regional Research Laboratory, and by Dr. Nelson Rodgers, research director of the Western Condensing Company at Appleton. A third paper by Merlin Peterson of the University of Wisconsin biochemistry department will be concerned with proteases. Discussion will be led by Dr. Austin Hansen, microbiologist for the Western Condensing Company.

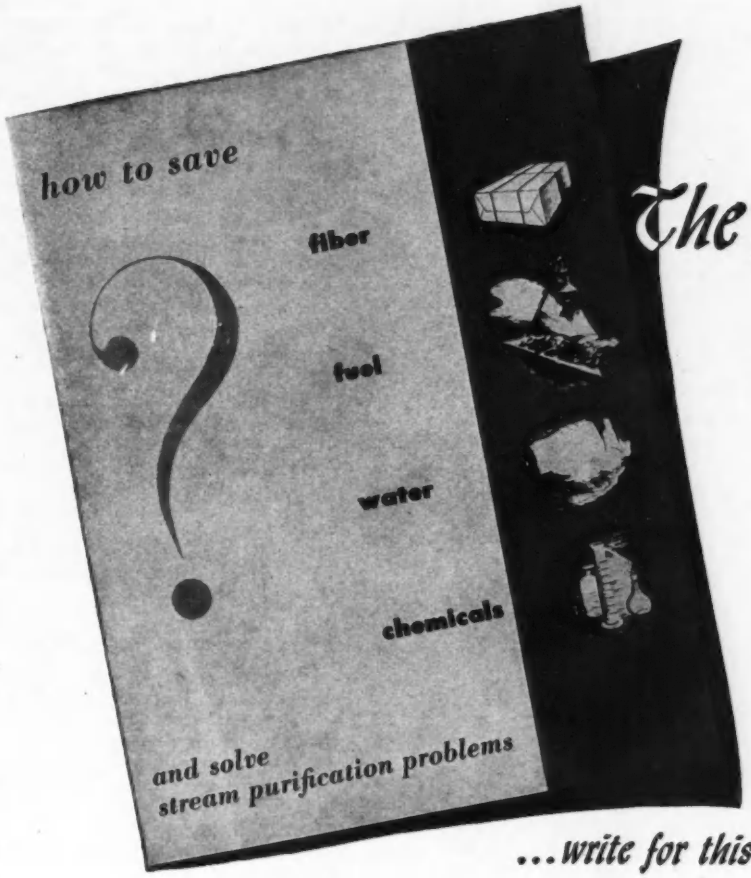
The afternoon session, under chairmanship of Dr. John W. Appling, Institute bacteriologist, will be concerned with commercial enzymes and of particular interest to representatives of the paper industry. C. E. Denoon of the Rohm and Haas Company, Philadelphia, will review industrial enzymes and their application, while Messrs. H. Little K. Walseth and A. P. Yundt, graduate students of the Institute of Paper Chemistry, will discuss individual enzymo systems.

After an evening dinner at the Conway hotel, the meeting will be continued with two papers on amylases by Dr. Eric Kneen of the Kurth Malting Company, Milwaukee, and by Dr. Pigman. Kenneth Wink of the Kimberly-Clark Corporation, Neenah, will lead the discussion. Mr. Wink was in charge of reservations for the dinner.

Worcester to Facilitate Norton Addition

WORCESTER, Mass.—A recommendation that the city borrow $160,000 to divert and cover Weasal brook at the former fairgrounds to permit expansion by Norton Company was approved at a joint session of the city council finance and sewer committees.

Earlier the finance committee visited the proposed project and was told by Norton Company officials a new plant to be built on the grounds would cost approximately four million dollars and cover six acres. The committee was shown a model of the proposed building. Work is expected to begin this summer.



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FINANCE

Brown Reports Net Of $1,593,982 for 1946

BERLIN, N. H. — Brown Company, producer of paper, pulp and allied products, shows consolidated profit, after taxes, of $1,593,982 for the year ended November 30, 1946, comparable with $1,219,808 for 1945 and $1,298,244 for 1944, in its annual report released by Frederic G. Coburn, president. Consolidated working capital of the parent Brown Company and its Canadian subsidiary, Brown Corporation, increased $1,481,887 from the year's operations after applying $686,103 to payments under loan indentures, $1,394,718 to capitalized replacements and essential improvements to plant and timberlands, and $93,266 to settlement of prior years' obligations under a power contract. This increase in working capital was wholly absorbed by increases in inventory items and advance payments on pulpwood operations caused by increased costs of labor and materials, principally pulpwood.

Earnings in 1946 computed according to the indenture securing the general mortgage five percent bonds were adequate to insure payment of bond interest when due on June 1 and December 1, 1947.

In October, Brown Company refinanced its first mortgage loan from RFC, the new holders of the First National Bank of Boston and three New England life insurance companies. The amount of the indebtedness $6,250,000, is the same as it would have been if the company had continued with RFC.

During 1946, substantial progress was made on construction of a new sulphate pulp mill at Berlin, N. H., to be integrated by stock line with a new 196-inch towel paper machine to be installed at the Cascade Paper Mill. No benefits will be realized from these projects until 1948. These projects which are being financed from the proceeds of the first mortgage loan and from earnings constitute the first step in the overall improvement program for the mills at Berlin.

National Gypsum Net Is Four Times 1945 Profit

NEW YORK—The annual report of the National Gypsum Company, issued to shareholders by Melvin H. Baker, president, showed that the net profit of $4,023,952 for 1946 was four times the 1945 net of $1,000,616.

Earnings for the last year are equivalent, after preferred dividend requirements, to $2.21 a common share, compared with 51 cents a common share for 1945.

The report noted that the increase had been possible in spite of price advances of less than 16 per cent above 1940 averages and only 7 per cent since the end of the OPA control. The increases reflected record high sales of $38,056,822, 42 per cent above 1945 levels and 57 per cent ahead of the company's best pre-war year.

Gair of Canada Offers $1.5 Million New Shares

TORONTO, Ont.—A new issue of $1.5 million 4 percent cumulative preferred shares, par $100, of Gair Company, Canada, has been sold at $98.75 a share to yield about 4.05 percent by a syndicate headed by Dominion Securities Corporation.

Proceeds are for the retirement of the outstanding $867,600 6 percent first and general mortgage bonds due April 1, 1956, called for redemption on April 1, 1947, at $100 and accrued interest. Balance of proceeds is for additional working capital.

Also revealed by the prospectus was the sale of 27,700 authorized unissued common shares par $10 to the parent company, Robert Gair Co., Inc. For these common shares, having a total par value of $277,000, and $123,000 U. S. funds, the parent company surrendered the $400,000 note payable to it due March 31, 1947.

Capitalization on completion of financing consists of 15,000 shares 4 percent cumulative preferred, par $100, and 120,000 common shares, par $10. Gair Co., Canada, is a wholly-owned subsidiary of Robert Gair Co., New York.

Hinde & Dauch Acquires Site

TORONTO, Ont. — Hinde & Dauch Paper Company of Canada has bought a 10-acre site near Chatham, Ont., plus 150,000 square feet in a box factory in an expansion program, it is reported by William Gray, of the Chatham Industrial Service Bureau. The Chatham plant will employ 150 workers at the beginning, two-thirds of whom will be men.

FINANCIAL RECORD OF THE WEEK

New York Stock Exchange

High, Low and Last for Week Ending March 15, 1947

STOCKS

	High	Low	Last
A. P. W.	5½	5¼	5¼
Armstrong Cork Co.	50¾	49	50¾
Armstrong Cork Co., pf.	106	105½	105½
Celotex Corp.	29⅞	28⅝	28⅝
Celotex Corp., pf.	21½	21	21
Certain-Teed Products Corp.	17⅝	16¼	16⅞
Certain-Teed Products Corp., pf.	....	....	....
Champion Paper & Fibre Co.	24¼	22	22
Champion Paper & Fibre Co., pf.	110	109	109
Congoleum Nairn Co.	28	27⅝	27¾
Container Corp. of America	45	41¾	42⅛
Crown Zellerbach Co.	30¾	28¾	29
Crown Zellerbach Co., pf. 4.20	107½	106¾	107
Crown Zellerbach Co., 4 pf. 4	119¾	116	117½
Dixie Cup Co.	31	30½	30½
Dixie Cup Co. A	52¾	51	52¾
Flintkote Co.	32	30½	30½
Flintkote Co., pf.	108½	107	108½
Robert Gair	7¼	6⅝	6¾
Robert Gair, pf.	19¾	19¼	19¾
International Paper Co.	47¼	45	45⅝
International Paper Co., pf.	104½	104	104
Johns Manville Corp.	127½	123	123
Johns Manville Corp., pf.	....	....	....
Kimberly-Clark Corp.	25¾	25	25
Kimberly-Clark Corp., pf.	110	109	109
Mac Andrews & Forbes	34¾	34	34
Mac Andrews & Forbes, pf.	....	....	....
Marathon Corp.	25½	23½	23⅞
Mead Corp.	20¾	19¾	19⅞
Mead Corp., pf. 4¼	102¾	102½	102½
Mead Corp., pf. 2	48¾	47	47
National Container Corp.	38⅜	36½	37
Paraffine Companies, Inc.	....	....	....
Paraffine Companies, Inc., pf.	....	....	....
Rayonier, Inc.	22⅜	21½	21⅜
Rayonier, Inc., pf.	37⅝	37⅛	37⅛
Ruberoid Co.	53	51	51
Scott Paper Co.	44	41½	41½
Scott Paper Co., pf.	100	99½	99½
Sutherland Paper Co.	43½	40⅜	40⅜
Union Bag & Paper Corp.	31¾	30	30½
United Paperboard Co.	17⅜	16⅜	16⅜
U. S. Gypsum Co.	101	95	98
U. S. Gypsum Co., pf.	....	....	....
West Virginia Pulp & Paper Co.	42½	41	41
West Virginia Pulp & Paper Co., pf.	110½	110½	110½

BONDS

Abitibi Pulp & Paper Co., 5s '53	....	....	....
Celotex Corp. 3¾s '60	....	....	....
Certain-Teed Products Corp. 5½s '53	....	....	....
Champion Paper & Fibre Co. 3s '65	103¾	103¾	103¾
Mead Corp. 3s '66	103¼	103¼	103¼

New York Curb Exchange

High, Low and Last for Week Ending March 15, 1947

STOCKS

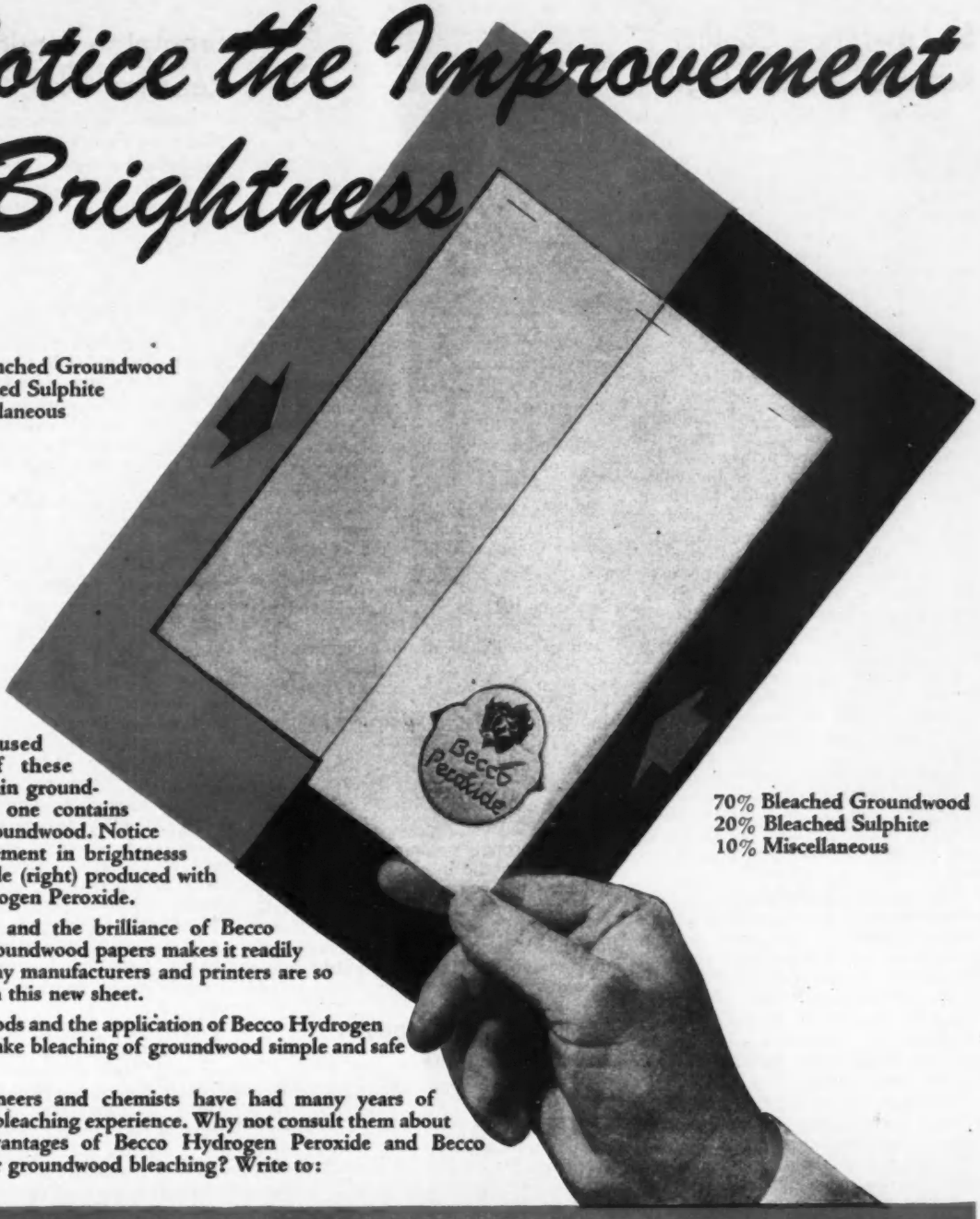
	High	Low	Last
Great Northern Paper Co.	42	40¼	40¼
Hummel Ross Fibre Corp.	31	29⅞	29⅞
St. Regis Paper Co.	9⅜	9	9
Taggart Corp.	8¾	8½	8¾

BONDS

American Writing Paper Co. 6s '61	101	100½	100½

Notice the Improvement in Brightness

70% Unbleached Groundwood
20% Bleached Sulphite
10% Miscellaneous



70% Bleached Groundwood
20% Bleached Sulphite
10% Miscellaneous

The pulp used in both of these papers contain groundwood, only one contains bleached groundwood. Notice the improvement in brightnesss of the sample (right) produced with Becco Hydrogen Peroxide.

The clarity and the brilliance of Becco bleached groundwood papers makes it readily apparent why manufacturers and printers are so interested in this new sheet.

Becco methods and the application of Becco Hydrogen Peroxide make bleaching of groundwood simple and safe in the mill.

Becco engineers and chemists have had many years of specialized bleaching experience. Why not consult them about all the advantages of Becco Hydrogen Peroxide and Becco methods for groundwood bleaching? Write to:

BECCO SALES CORPORATION
AGENTS FOR BUFFALO ELECTRO-CHEMICAL COMPANY, INC.
18 Sawyer Avenue, Buffalo 7, N. Y.
New York Boston Philadelphia Chicago Charlotte

St. Lawrence Conflict Reaches Proxy Stage

MONTREAL — Conflicting movements to control the St. Lawrence Corporation have reached a stage where the present management has appealed for support of the Shareholders' Representative Committee. Formation last week of a Stockholders' Committee of St. Lawrence Corporation Limited under the chairmanship of Arthur F. White of Toronto, former president of the corporation, was followed immediately by a statement from A. K. Cameron, now St. Lawrence president.

"This so-called Stockholders' Committee should not be confused with the Shareholders' Representative Committee, of which Ross Clarkson, vice-president and general manager of The Royal Trust Company, is the chairman," declared Cameron's statement. "The directors of the corporation have indicated their intention to co-operate fully with the Shareholders' Representative Committee, and decry the formation of the opposing Stockholders' Committee, which is not in the general interest of the shareholders.

"Mr. White was a former officer and director of St. Lawrence Corporation Limited and its subsidiary companies, but resigned some months ago at the request of his co-directors from all companies of the St. Lawrence group, with the exception of Brompton Pulp & Paper Company Limited. Mr. White was also asked to resign as an officer and director of the Brompton Company.

"We strongly recommend that the shareholders of St. Lawrence Corporation Limited refrain from signing any proxies until they have received the report of the directors for the fiscal period ended December 31, 1946."

Later in the week, A. K. Cameron, president, St. Lawrence Corporation Limited, addressed shareholders in even stronger terms.

"You may," he wrote, "have received a letter dated March 10, 1947, and a form of instrument of proxy from a self-styled Stockholders' Committee under the chairmanship of Mr. Arthur F. White of Toronto.

"Mr. Arthur F. White was a director and officer of this corporation and of St. Lawrence Paper Mills Company Limited and Lake St. John Power & Paper Company Limited. His co-directors became dissatisfied with his supervision of the corporate affairs and, considering their duty to the shareholders, insisted some months ago that he resign.

"Mr. Arthur F. White is still president and managing-director of Brompton Pulp & Paper Company Limited, but his resignation from that company was also requested by your corporation prior to the publication of the White Committee letter. The request for Mr. Arthur F. White's resignation from the Brompton Company was delayed pending consideration of a report of a survey of the Brompton Company's Red Rock project made by independent engineers following the demand of your corporation. This report, in the opinion of your directors, fully justified the request for the resignation of Mr. Arthur F. White.

"Reports of the operations of the three subsidiary companies of your corporation will be forwarded to you within the next few days. Pending such reports it can be stated that St. Lawrence Paper Mills Company Limited and Lake St. John Power & Paper Company Limited have both had a very satisfactory year.

"During the last six years these two companies have shown a combined improvement of approximately $10,000,000, and in addition, dividends in excess of $3,000,000 have been paid by St. Lawrence Paper Mills Company Limited on its preferred stock.

"Dividends from Brompton Pulp & Paper Company, Ltd., which is at present the sole source of revenue of the corporation, have fallen from $2 per share in 1941 to $1.50 in 1942 and to $1 per share from 1943 to date. The future possibility of any increase in dividends from the Brompton Company are at best uncertain pending establishment of the earning power of the Red Rock project. This situation affects the ability of your corporation to pay dividends on its Class "A" stock, in arrears, as at December 31, 1946, to the amount of $5,281,060 or $20 per share.

"It is strongly recommended by your directors, in the interest of all shareholders, that you refrain from signing any proxy for the Annual General Meeting of Shareholders until you have had an opportunity to examine the factual material which will be submitted by your directors."

Chillicothe Sales Topped Two-Million Figure

CHILLICOTHE, Ohio—The Chillicothe Paper Company had a net income of $452,263 for the year ending December 28, 1946, Austin P. Story, company president, reported at the annual meeting of shareholders last week. Net sales of the company for the same twelve months amounted to $2,021,222 and net income before provision for federal taxes came to $279,766. Federal income taxes amounted to $279,766.

Story was reelected president. Other officers of the company who were reelected at the meeting are E. F. Bearce, vice-president; L. L. Evans, secretary; Norbert A. Seidensticker, treasurer; and Harold Breil, controller.

In addition to Story, Bearce and Evans, directors of the company are Dr. L. E. Hoyt and Russell McVicker of Chillicothe and O. A. Miller and Major William P. Baker of Columbus, Ohio.

Brompton Funded Debt Reaches $4,475,976

TORONTO, Ont. — The report of Brompton Pulp & Paper Company on its 1946 operations, published during the week, was of special interest to investors and others interested in pulp and paper securities. Brompton is the first of the St. Lawrence Corporation group to report on last year's operations and since its project at Red Rock, Ont., was supposed to be what started the battle for control of St. Lawrence by two different groups, the report was carefully read for indications of the genesis of the trouble. However, the report made no reference to the trouble over the Red Rock project, but did reveal that the new kraft mill at Red Rock started operations in January, 1946, and produced 29,535 tons in the second half of 1946, as against 22,170 tons in the first six months.

The total cost of the Red Rock mill, exclusive of expenditures on woodlands developments, was $6,741,986 at Dec. 31, 1946, according to the report. An additional $958,042 has been spent on Brompton Lands, Ltd., a wholly-owned subsidiary, formed to develop the townsite. The capital outlay for the development of the Nipigon timber limits stands at $625,782.

Consolidated fixed assets of the company total $15,754,710, nearly 70 percent higher than the $9,295,512 figure at Dec. 31, 1939. Depreciation and depletion reserves were up nearly 74 percent (to $5,790,986, from $3,332,034) in the same period and amount to 36.7 percent of the fixed assets.

Current assets of $5,901,374 are 2.1 times their amount of $2,764,678 at Dec. 31, 1939, and include $1,924,015 of bank loans (up from $1,100,000 a year previously).

Consequently, although working capital of $2,420,680 is up $427,198 in the year and about the same as the $2,419,651 reported for Dec. 31, 1939, the ratio of current assets to current liabilities is considerably weaker (1.72 to one, as against 8.01 to one). Further bank loans constitute 57 percent of current liabilities. Funded debt now amounts to $4,475,976 as against nil in 1939.

This change in the financial picture is said to be one of the causes of the current disagreement. Further capital expenditures are contemplated which will add to the debt, it is pointed out in the report.

On the earnings side, Brompton's net profit of $639,545 was nearly 2.1 times the 1945 figure and, except for the $845,732 figure in 1941, was the highest since 1929. Earnings included $259,797 transferred from reserve for inventories and contingencies. Higher prices, plus a 46 percent jump in production (161,578 tons against 110,669 tons in 1945) would contribute to the better results.

–count on UFORMITES 467 and 470 to meet requirements at low cost

Sanitary garbage bags *must* have high wet strength properties to prevent breakage. Here, as in many other applications, the UFORMITES supply that important quality . . . efficiently, economically.

UFORMITE 467 was specifically developed for use with Kraft by beater addition. UFORMITE 470 is recommended especially for sulfite stocks but can be used advantageously with Kraft, rag and groundwood.

If you are manufacturing bags, wrapping paper, toweling, soft tissues, glassine, map, chart or ledger paper, you'll want to use these urea formaldehyde resins. Why? Because neither UFORMITE 467 nor UFORMITE 470 affects the color, odor or taste of paper. Because no special equipment or handling is required for their preparation or use. Because as little as 1% resin on dry fibre weight will increase wet strength as much as 300%. Because the UFORMITES improve dry tensile and Mullen, fold, uniformity of sizing, and coating service characteristics.

See for yourself how the UFORMITES, at low cost, can increase the value of your paper production. Write for full details today.

UFORMITE *is a trade-mark, reg. U. S. Pat. Off.*

Represented by Cia Rohm y Haas, S.R.L. Carlos Pellegrini 331, Buenos Aires, Argentina, and agents in principal South American cities.

THE RESINOUS PRODUCTS & CHEMICAL COMPANY

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Trees for Tomorrow Opens Camp in May

MERRILL, Wis.—The Trees for Tomorrow Conservation Camp at Eagle River, Wis., will open early in May this year, due to the demand for its facilities, the organization announced last week in its March issue of "Tree Tips."

Thus far the following groups have scheduled sessions at the camp: The forestry class at Central State Teachers College, Stevens Point; conservation and forestry groups from Wisconsin River Valley high schools; members of the United States Forest Service personnel from Milwaukee regional office; 65 persons under the sponsorship of the Milwaukee Museum; Wisconsin Valley educators; 4-H Club boys and girls from Vilas and Oneida Counties; a five-week summer session sponsored by Wisconsin state teachers colleges; Milwaukee Nature Club; Milwaukee Conservation Alliance; Institute of Paper Chemistry; a conservation workshop for educators; and an award group of 4-H Club boys and girls to be selected by Wisconsin Valley agricultural agents.

There will be a number of improvements this spring at the camp. A building formerly used as a garage will be converted into a combination laboratory and study hall. A map of the area showing points of interest is being prepared by Don Ball, supervisor of the Nicolet National Forest. On the obverse side there will be detailed explanations of what can be found on trips to nurseries, forest plantations, demonstration forests, fish hatcheries, wood-using industries, scenic drives and experimental plots laid out by the Northern Wisconsin Forest Research Center.

A committee has been named to help outline programs for the various groups. It includes Vico Isola, U. S. Forest Service, Milwaukee; W. T. Calhoun, state conservation department, Madison; and W. A. Sylvester, forester for Trees for Tomorrow, Merrill.

Kimberly-Clark Adds Machine For Creped Wadding

NEENAH, Wis. — Kimberly-Clark Corporation is making installations for its new 180-inch creped wadding machine, now being assembled, in its new 101-foot addition at its Lakeview mill. The machine, said to be the world's fastest, was expected to be in operation March 15, but will not be rolling until about the middle of April.

It will have many new features with 174-inch instead of 133-inch wire, while centralized control panels as well as some piping and conduits are built into the frame, eliminating dust collectors. The house for the new paper machine was started early in 1946 and is a brick structure, matching in design the Lakeview mill.

Becker Again Heads Trees for Tomorrow

MERRILL, Wis.—Folke Becker, president of the Rhinelander Paper Company, was reelected president of Trees for Tomorrow, Inc., at the annual meeting Saturday, March 15.

Others elected were: E. B. Hurst, Consolidated Water Power and Paper Company, Wisconsin Rapids, and C. G. McLaren, Tomahawk Kraft Paper Company, Tomahawk, vice-presidents; D. B. Smith, Ward Paper Company, Merrill, secretary-treasurer; and M. N. Taylor, Merrill, executive director.

The following directors were elected: D. C. Everest, Marathon Corporation, Rothschild; N. S. Stone, Mosinee Paper Mills, Mosinee; Robert Caldwell, Rhinelander Paper Company, Rhinelander; Carl Bronsted, Tomahawk Pulp Company, Tomahawk; A. J. Schierl, Whiting-Plover Paper Company, Stevens Point; Stanton Mead, Consolidated Water Power and Paper Company, Wisconsin Rapids; E. E. Zahn, Marathon Corporation, Rothschild; Harold C. Collins, Wausau Paper Mills, Brokaw.

Mr. Becker reported that 3,290 acres of private woodland and school forest tracts had been mapped for forest management purposes in 1946. He said that there was a 62 percent increase in requests for trees this year but that due to a shortage it would be necessary to ration the seedlings.

Marathon Grants Wage Boost To $1 an Hour Base Rise

WAUSAU, Wis.—Employes of Marathon Corporation have been granted a wage increase of five cents an hour, effective February 24, with an additional three cents per hour effective April 1, as the result of recent negotiations.

The agreement, which covers all employes under the jurisdiction of the International Brotherhood of Paper Makers and the International Brotherhood of Pulp, Sulphite and Paper Mill Workers, was reported jointly by Reinold Ganzer, wage and salary administrator of Marathon Corporation; Emil Noren, area director of the Paper Makers Union; and Ray Richards, vice-president of the Pulp and Paper Mill Workers.

The wage increase, which affects employes of Marathon plants at Menasha, Rothschild, Wausau and Ashland, Wis., will result in a base pay of $1 an hour for male employes and 88 cents for female workers.

Crane Presents Library Books on Paper Making

DALTON, Mass.—The Dalton public library has received a set of six books concerning the manufacture of paper and pulp from Crane & Company. The books were presented in memory of Edward O. Reed, late technical director of the company.

District Merchants Appoint Wilkinson

WASHINGTON, D. C. — George A. Wilkinson, well-known Washington attorney, has been approved as executive manager of the District of Columbia Paper Merchants Association. The Washington paper merchants group has depended upon a member of the association as secretary in the past. Looking ahead to the return of normal competitive conditions, the members decided to enlist the services of an experienced trade association executive to strengthen and expand their organization to meet their future problems.

Mr. Wilkinson's job will be to secure from all members the cooperation desirable and necessary to do those things which can be done as a group better than as individual businesses. After a preliminary survey he will present a plan for unified action which will insure fair trade practices and healthy growth in the paper distributing field in and around Washington.

The new executive manager is 42 years old. He is a native of St. Mary's County, Maryland, but has been a Washington resident for the past seventeen years. He attended Maryland schools, Leonard Hall High School, and received his degree of LL.B. from Columbus University School of Law in Washington. He is a member of the District of Columbia Bar, and of the Bar of the Supreme Court of the United States.

After sixteen years with a building supply firm in Baltimore and Washington, as salesman and later credit manager, Mr. Wilkinson became secretary-manager of the Washington Association of Credit Men. Since 1943 he has been engaged in the general practice of law in Washington as a member of the firm of Bresnahan, Eberly & Wilkinson.

Mr. Wilkinson is married and has three children. He resides on Upshur Street in Washington, and also maintains a home on his farm at St. Clements Bay, St. Mary's County, Maryland. He finds his relaxation in water sports, including swimming, boating and fishing.

Willimantic Rotary Visits Smith & Winchester Plant

SOUTH WINDHAM, Conn.—Members of the Willimantic Rotary Club recently inspected the plant of the Smith & Winchester Manufacturing Company, one of the oldest paper machine builders in the country. After luncheon was served, the group was divided into smaller groups and conducted by special guides through the plant where they had a chance to inspect all phases of production from drafting room, pattern shop, foundry, machine shop, to final testing of several new paper and bag machines, some of which are going to Africa.

Hammermill Traffic Control Speeds Its Operations

Acting upon the findings and recommendations of its engineering department, Hammermill, about two years ago, authorized the setting up of a department charged with coordinating and centralizing all material handling and transport. The action was necessitated because of the fact that annual production was well over 100 million pounds of some 3,000 kinds, sizes and colors of papers for business use, and that prevailing methods of handling and routing the tonnage involved tended, in some degree, to nullify some of the benefits obtainable from the use of modern, mechanized methods of material handling.

Careful, comprehensive, surveys were made by the company's engineering department before it recommended that " . . . control and dispatch of all transportation equipment and personnel should be incorporated under one department . . . ," and that such a department should have " . . . the full-time service of a qualified person to take care of the details and expedite the material handling program."

After the program had functioned on a six-month trial basis, a second engineering survey disclosed:

Full utilization of all equipment and better control of personnel.

More material had been handled with the same amount of equipment.

Material handling costs had been reduced.

Equipment, in general, was in better condition.

Better service had been rendered various operating departments.

Also, the program had resulted in adoption of the pallet-and-fork-truck method for handling raw, in-process and finished product wherever the product is adaptable.

In essence, the report emphasized that centralization of handling operations—instead of departmental control — resulted in the utilization of the existing fleet of storage battery-powered industrial trucks to the best advantage in the receiving, production, warehousing and shipping departments, and that maximum service had been rendered at minimum cost.

Departmental superintendents of the Hammermill Paper Company, Erie, Pa., freed of material handling problems then are permitted to concentrate upon production operations. Safety hazards have been notably reduced. Heavy types of manual labor have been eliminated with the extension of mechanized applications; such labor is diverted into higher skills with resultant benefits both to personnel and management; work flow has been made more efficient and direct; handling costs, both of incoming manufacturing supplies and outgoing shipments, have been lowered and, with all handling equipment under one control, there is adequate equipment available to all departments, and maintenance costs have been lowered. This was uncovered by a survey at the end of 1946, when a fleet of 24 storage battery-powered industrial trucks was in daily operation. Several more were on order for delivery in 1947. The use of such type trucks began nearly a quarter of a century ago. Then a 6,000-lb. capacity, highlift platform truck was placed in service for handling and storaging baled broke, and for various miscellaneous services such as movement of heavy machinery. The report of the engineers on this truck said:

Storage battery-powered truck with special tilt-type platform, used by Hammermill Paper Company to charge beaters with pulp. Hammermill engineers' report stated: "This method proved to be the only advisable means of handling these loads" and that "sizeable savings were made * * in handling cost."

"The results obtained . . . were most gratifying and its existence justified."

In subsequent years additional battery-powered trucks were purchased as new uses for them were developed. Most were of the platform-lift type, some being fitted with special devices and assigned to particular operations. "In all cases," said the engineers' report, "sizable savings were made, not only in handling cost, but also the jobs in which the trucks were used were made many times easier."

The first fork-lift truck was acquired some twelve years ago for use at the wet machine in the handling and storage of wet pulp, with consequent reduction of manpower required in that area and a reduction in labor costs. A special low-lift platform truck was acquired to haul back and forth from storage and shipping large skidloads of carton-packed paper. "This method proved to be the only advisable means of handling these heavy loads," the engineering report said in part. In order to further reduce the labor involved in handling large skidloads of packed cartons and bulk paper, another highlift fork-truck was acquired. This, however, soon was placed in use at the wet machine in conjunction with the fork-lift mentioned at the beginning of this paragraph.

As labor shortages developed and storage and shipping operations expanded, mechanical means for handling paper in areas became more of a necessity. A reassignment of truck operations was made, the highlift fork-truck, being placed in operation in the storage and shipping area. "The re-

Transporting finished paper from the mill to the paper warehouse at the Erie, Pa., plant of the Hammermill Paper Company by means of a storage battery-powered tractor and special type platform trailers. Palletized loads are positioned on the trailers by means of battery-powered fork-lift trucks and, at destination, are removed by same type trucks. Weight of loads shown is about 6,000 pounds. Note method of tiering palletized loads in background, thus making use of all of the vertical air rights in the warehouse.

Increased production, faster materials handling and greatly reduced handling costs are some of the important economies brought to industry by the Electric Battery Hand Truck. It can be handled by one man with amazing ease . . . guided through narrow aisles, around sharp turns and up and down grades, always under absolute control. And when batteries are Exide-Ironclads, you are assured of dependable, safe, low-cost performance.

Exide-Ironclad Batteries have the *high power ability* required for frequent "stop and go" service . . . the *high maintained voltage* that repeated lifting and hauling demands . . . and the *high capacity* that assures steady, day-long performance with full shift availability. You can always count on Exides for dependability, long-life and ease of maintenance.

Write us for a FREE copy of Exide-Ironclad Topics which contains "Case Studies" of materials handling problems. It tells how to cut handling costs up to 50% . . . covers latest developments in handling materials from receiving to shipping.

THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia 32 • Exide Batteries of Canada, Limited, Toronto

WHEN FELT LIFE WAS PROLONGED 500%

. . . we knew we had something unusual for the paper industry.

And we have. It is called Compound G-4*—our fungicidal agent. And though 500% was the best result obtained, felt life was substantially prolonged in every test, in no case less than 45%.

And here's PROOF! Two Yankee top felts were compared under normal operating conditions. One, untreated, ran only 11 days when deterioration through mildew required its removal; the other, treated with only 3% of G-4 by weight, ran for five and a half weeks. And in another series of trials, average life of treated felts was over 22 days, as compared with an average of five days for untreated felts, which literally rotted off the machines!

You will find G-4 doubly economical . . . in your initial cost, because a little goes a long way . . . and in your later costs, because it extends felt life, helps to sustain production, prevents shutdowns.

In every application, G-4 leaves the felts soft, open and bacteria-free . . . resists leaching . . . remains present in effective fungicidal proportions when felts are removed.

You can secure these advantages in your felts, too. Write today for G-4 samples and prices.

Dihydroxy Dichloro Diphenyl Methane

"BUY WISELY—BUY GIVAUDAN"

Givaudan-Delawanna INC.

Industrial Products Division

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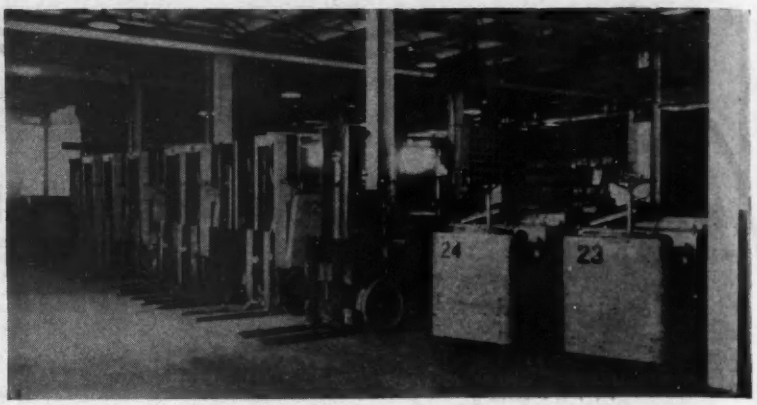
sults obtained were amazing," the engineering survey stated, adding, "The handling of paper within the department and the loading of cars all by the use of the truck actually took the place of six men. . . . "

Increased volume of material was handled with less labor through employment of battery-powered trucks under recommendations made by the methods and engineering departments. In one operation, involving incoming shipments of foreign pulp, it took seven men five hours to unload, weigh and store a box-car load of pulp using hand trucking methods. With the use of an electric truck, one man, the operator, did the same operation in a maximum of three hours, thus reducing the time and labor cost of unloading a box-car of pulp by 32 man-hours.

Battery-powered trucks also were used in the transport of the pulp from storage into process, and later to handle the finished product in long rolls into packaging and into outward shipment. A total of three fork-lift trucks, with removable forks, and an extended boom attachment, were used in the rag-pulp-rag-paper operation, the boom arrangement handling the long rolls in transport around the field, and in and out of box-cars.

A diversity of products and sizes of packages, both in incoming raw material, and outgoing finished product, made it imperative that some uniform method of handling material should be adopted. The pallet-and-fork-truck system, as stated previously, was adopted insofar as possible. One problem that presented itself to the transportation department was in the shipment of lap pulp. These laps, at one time, had been loaded into freight cars one by one. Now they are shipped in unit loads, each of about two tons.

The load, at one time, was built up on a skid which had spacer strips for insertion of the forks of the truck, the load resting directly on the forks when it was lifted. Withdrawal of the forks at place of deposit without upsetting the load then presented a problem. It was not economical to use pallets. After considerable study small supporting frames, or sleeves, into which the forks could fit, were placed in the openings on the skid, and the unit load built on these. The movement into the box car is easily made and after deposit of the load, the forks are withdrawn, the sleeves being left under each load. The loads are quite easily double-decked, and the cost of the frames—which are made of scrap lumber—is negligible.



Part of the Hammermill Paper Company's fleet of storage battery-powered industrial trucks. Fork-lift, fixed and low-lift platform trucks, tractors and several special duty types make up the fleet of 24 trucks. Several additional trucks are being added for duty in new warehouse which Hammermill has constructed on plant property.

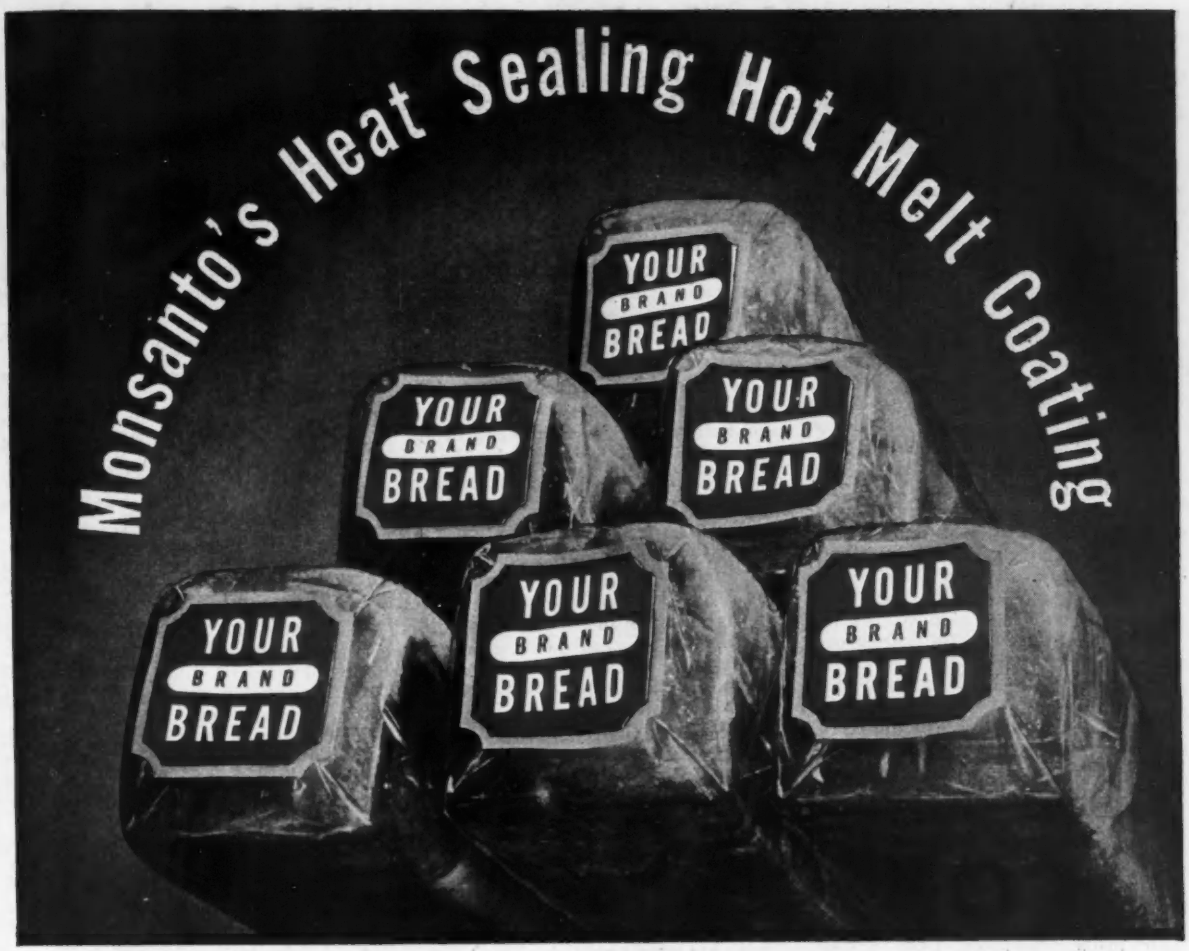
The use of the fork-truck to load a car with lap pulp also has resulted in considerable saving. Under manual means it required 20 man-hours for loading. Now, one operator and the fork-truck, does the job in three hours, while the saved man-hours are diverted to higher skills in more productive operations.

Negotiations with all suppliers of bagged material to ship in unit loads on pallets, have been started by Hammermill, and the first results are beginning to be realized. Many of the raw materials — such as clay, starch, talc — are received in bags. These have been, or now are being, palletized at the receiving point. A typical carload comprises some 1,600 bags, each of about 50 pounds in weight. It had required some 14 hours to palletize at the receiving point, but it is anticipated that when all suppliers ship in unit loads on pallets, unloading and warehousing will not take much more than two hours per car.

The palletizing of shipping cartons, which are received in knock-down condition, or "flats," from manufacturer, also has resulted in a great saving in time in receipt and warehousing. A special type of four-way pallet, supplied the manufacturer of the cartons by Hammermill, is used. The "flats"

One of the Hammermill Paper Company's fleet of storage battery-powered fork-trucks picks up a load of lap pulp for movement into a box-car for outward shipment. Load is carried on two scrap lumber "sleeves" which fit over forks of truck. Skid-jig shown under load is used to accommodate "sleeves" and permit building of load.

Pallet-loads of sacked starch received at Hammermill Paper Company warehouse being tiered by means of battery-powered fork-lift truck. Note method of "locking" sacks in stacking so as to prevent side-slipping of load, and insure evenness of tiering surface. Most sacked, or bagged, material can be stacked in unit-loads in this fashion.



for End Labels

Whatever your product, your label *should* do a big job. And you can be sure that it *does* that job right when it is coated with Monsanto's heat sealing hot melt coating.

For example, on the end labels for specialty breads, Monsanto's heat sealing hot melt coating does an especially important job:

1. Ends of the wrapper effectively sealed
2. A clean, quick labeling operation
3. Labels positioned for most effective display
4. Eliminates expensive and unsatisfactory inserts, bands and glued labels
5. Provides a method for quick label changes, making coding and dating simple
6. An opportunity for a colorful, salesmaking message

You can get these same labeling advantages for your product. This special plastic coating will make your label stick to cellophane, waxed paper, glassine, acetate or foil. You can count on maximum labeling efficiency and economy by using labels coated with Monsanto's heat sealing hot melt coating.

Ask your label supplier for complete information, or write direct to: MONSANTO CHEMICAL COMPANY, Plastics Division, Springfield 2, Massachusetts. In Canada, Monsanto Ltd., Montreal, Toronto, Vancouver.

arriving in unit loads strapped to the pallet, are taken from the cars and warehoused in approximately three hours. When received in loose condition, as formerly, it took 24 man-hours to unload a car.

New and enlarged warehouse facilities at Hammermill have just been completed. The new warehouse was designed for, and built about, the mechanized handling of loads. More space is provided for the finished goods than was obtainable under the old warehousing system. The new layout has been planned to speed the order assembly and shipping operations, and to eliminate previous manual handling.

Incoming pallet-bearing, battery-powered, tractor-trains bring loads into the warehouse from the production division and spot individual trailers near assigned storage stacks. A fleet of highlift fork-trucks pick the palletized loads from the trailers and tier them three high to an extreme height of 12½ feet. Each load, at maximum, is approximately 2,400 pounds. In the case of flat stock, which is not packaged, the loads are skidded, with a headboard strapped to the top to permit tiering.

Each tractor-train consists of two or three trailers, each with a pallet-load. After delivery and drop of trailers, the tractor proceeds through the warehouse area picking up empty trailers for return to production. Other tractors tow trains of trailers from the order selection and shipping areas, dropping loaded, and picking up empty, trailers in continuous operations.

In addition, fork-trucks also are used with trailers in order selection. Full pallet-loads are taken from storage space and placed on the trailer by the fork-truck, while a second load is picked up on the forks and the truck then attaches to, and tows, the trailer to the order assembly area. Various modifications of this system are in use.

A. J. Aubin, formerly of Hammermill's engineering department, who has been named superintendent in charge of the new material handling and transportation department, stated in a recent interview he expected through centralization of the warehousing and shipping operation, that overall costs would be reduced appreciably over old decentralized and largely manual methods; that better working conditions would be provided through elimination of heavy physical effort; and that warehouse space will be more fully utilized, while better and faster service will be provided Hammermill customers.

West Joins Walter D. Peek

NEW YORK—Gard West has become associated with Walter D. Peek, Inc., at 122 East 42nd Street. Mr. West, until his present connection, was with the Wright Company, agents for the St. Lawrence Paper Mills. Prior to his association with St. Lawrence he was with the International Paper Company.

Port Alberni Preserves Early Paper Samples

PORT ALBERNI, B. C. — Members of the City Council recently received an interesting souvenir of the first paper ever produced in British Columbia. The souvenir took the form of several samples of paper produced by the original old mill, which was established in Port Alberni in 1894 and operated for the following two years. The paper was made from jute rags shipped to Port Alberni from London, England. The samples of paper were forwarded by Alfred Carmichael and included a piece which Mr. Carmichael personally tore from the first sheet produced in the mill before it even went to the dryer. This piece is wrinkled with age, but other samples are in an excellent stage of preservation.

One of the samples was a sheet of paper, the first sheet from an experimental run of paper made from pulpwood. There were excellent samples of light manila and another sheet which was an experiment in making paper from bracken fern; a good example of building paper; also wrapping paper and tissue.

The council moved to send a letter of appreciation to Mr. Carmichael and has ordered that a special glass case be made in which the samples will be arrayed; to be placed in the city's vault, pending the organization of the archives.

The dream of the early pioneers, while at that time not fully aware of the wealth of raw material around them, has come true today. Early summer is expected to see start in operation of one of the largest pulp mills in British Columbia on a site not far distant from where the pioneering mill was begun.

Gurley Employees Win New Wage Increases

COHOES, N. Y. — Labor troubles are virtually non-existent in this section following the signing of new contracts by many of the principal firms. Negotiations were completed this week under which the several hundred employes of W. and L. E. Gurley Co., Troy, will receive a wage increase of ten cents an hour with other benefits. The firm produces paper testing equipment and was the winner of several awards during the war. The new contract was negotiated following the intervention of John A. Rooney, federal labor representative. The new agreements call for a wage increase, time and a half for Saturdays, six paid holidays yearly, double time for Sundays and holidays, time and a half for work after eight hours a day or forty hours a week, and other benefits. The contract is effective as of March 1 and wages are retroactive to that date. It brings the minimum starting wage to 75 cents per hour at the plant.

N.P.T.A. Completes Its Convention Program

(Continued from page 7)

for business meetings, a general session in the morning to be followed by a meeting of the fine paper group in the afternoon. The wrapping paper division will meet on Wednesday morning, to be followed in the afternoon by a closing general session, at which reports for the year will be submitted, and officers elected.

The program, in detail, follows:

SUNDAY, MARCH 30

Registration, Flamingo Room, Lobby Floor

2:00 P. M. Meeting of Executive Committee ..... Pillement Suite

MONDAY, MARCH 31

10:00 A. M. Registration, Basildon Room, Third Floor.

10:00 A. M. TWINE MEETING, C. A. Shaw, Chairman....Jade Room
By courtesy of the American Manufacturing Co., their new sound picture, "Forty Centuries of Service" illustrating the production of Rope and Twine will be shown at the conclusion of this meeting.

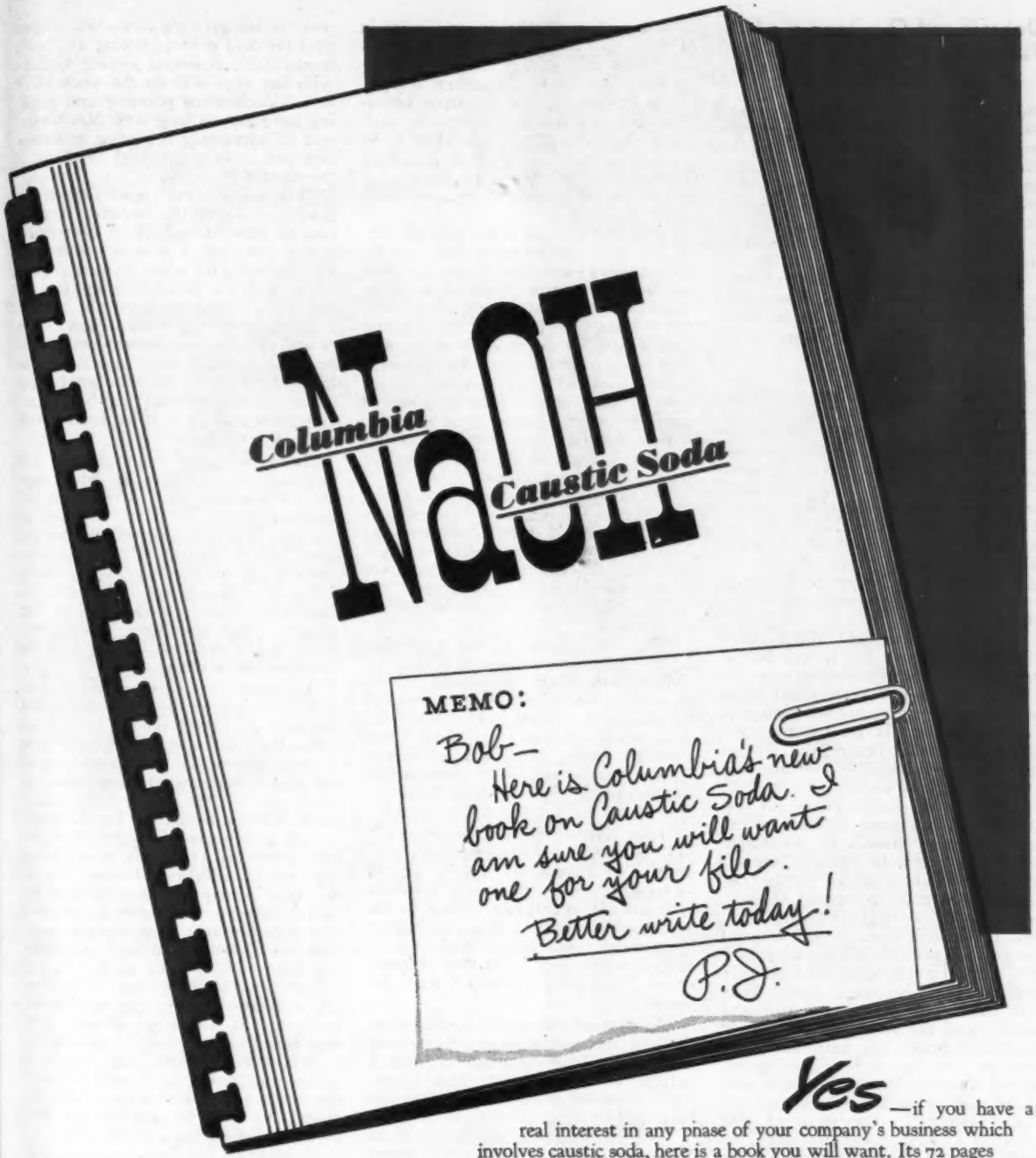
2:30 P. M. OPEN INDUSTRY SESSION, President G. E. Carpenter presiding ..... Jade Room
Open to Manufacturers and Guests
Speakers: Hon. Styles Bridges, U. S. Senator from New Hampshire; Reuben B. Robertson, Champion Paper & Fibre Co., President, American Paper & Pulp Assn.

TUESDAY, APRIL 1

10:00 A. M. GENERAL SESSION, President G. E. Carpenter presiding.. ..... Jade Room
Speakers: W. E. Long, Neal & Hyde, Inc., Rochester, N. Y., Former President, Wholesale Dry Goods Inst., "Distribution under our Changing Economy," E. W. Tinker, Executive Secretary, American Paper & Pulp Association.
Report of Committee on Operating Efficiency W. G. Leathers "Blue Prints for Economy," Asst. Secretary E. J. Huss, followed by Materials Handling film.
Report of Traffic Committee, R. W. Campbell, Chairman.

2:00 P. M. FINE PAPER DIVISION MEETING, Vice-President A. W. Towne presiding....Jade Room
Speakers: M. C. Dobrow, Writing Paper Mfgrs. Assn.; C. B. Morgan, Eastern Mfg. Co.; R. I. Worrell, Mead Sales Co.; H. W. Savage, International Paper Co.; Thos. Leech, Whiting-Plover Paper Co.
Final Report, Merchants Advisory Committee to OPA, O. F. Marquardt, Chairman.

(Continued on page 36)



Yes—if you have a real interest in any phase of your company's business which involves caustic soda, here is a book you will want. Its 72 pages —8½" x 11"—are full of information on the best procedures for unloading, handling and storing caustic soda. This is a comprehensive book for technical and operating men, engineers, purchasing agents and managing executives. We shall be glad to send you a copy if you will write us on your company letterhead.

COLUMBIA CHEMICALS

PITTSBURGH PLATE GLASS COMPANY

COLUMBIA CHEMICAL DIVISION

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COLUMBIA ESSENTIAL INDUSTRIAL CHEMICALS
Soda Ash · Caustic Soda · Liquid Chlorine · Sodium Bicarbonate · Pittchlor (*Calcium Hypochlorite*) · Silene EF (*Hydrated Calcium Silicate*) · Calcium Chloride · Soda Briquettes (*Iron Desulphurizer*) · Modified Sodas · Caustic Ash · Phosflake (*Bottle Washer*) · Calcene T (*Precipitated Calcium Carbonate*)

Dobrow and Overton Talk at Chicago

(Continued from page 7)

ing over by Russia of continental woodpulp mills has resulted in the supply of foreign pulp available to this market being reduced to approximately one-third of the pre-war supply. It is to be assumed that with the resumption of full operations abroad and the continued demand here, the tonnage from Scandinavia will eventually approach pre-war figures insofar as those countries are concerned. There will unquestionably, however, be an acute shortage of chemical pulp fibre for the next year or two.

"As to Europe's ability to furnish us old rags and new cuttings, we must realize that three basic factors will govern: (a) there will be every disposition to convert merchandise into dollars; (b) due to general deprivation resulting from war shortages, clothing will not be disposed of in anything like the quantities customary before the war; (c) high ocean freight rates will tend to reduce the net return to the foreign exporter and make competition with domestic rags difficult.

These variables will differ from country to country but it will be the duty of the American importer to remain on the alert for the opportunity to resume, to such extent as may be possible, dealings in foreign rags and similar materials. The regular flow of these commodities will tend to keep domestic markets stable."

Mr. Dobrow summed up for his audience in the same meeting recent figures on the growth in production and demand as a background for his presentation of facts in the supply field. "Production records," he said, "were not set without difficulty. Probably the chief obstacle encountered last year—especially in the last part—was obtaining adequate market pulp supplies. Likewise, rag content mills were hard pressed to obtain sufficient quantities of the better rag cuttings at reasonable prices. It may be a regrettable fact, but it is a fact nevertheless, that the United States is still in the midst of a very large and important inflation. The peak of this inflationary boom will probably be reached in the near future. Some prices have declined but we are not yet on the downward side for the economy as a whole.

"But the time for a change — a change downward — in the general price level may not be far off.

"Paper mills must continue to use increased amounts of waste paper and other substitute fibers. Early last year, following the lifting of the War Production Board's restrictions, there was a decided tendency in the white paper field to use less substitute fibers and to increase the use of virgin pulp fibers. As worldwide shortages of pulp again became evident, the trend was reversed. Consumption of waste paper established a new high record in 1946 —and will probably do so again in 1947.

"Since the demise of OPA, rag prices have advanced rather sharply. At least the rag content paper manufacturer, in a more or less stable business, considers an advance of 60 to 80 percent in a period of three months a pretty steep advance. There are, of course, good economic reasons why this happened.

"The rag content paper manufacturer has been faced with a short supply. Government subsidized cotton has filled an important gap. Without it, mills would have operated only three days per week in the last year or two, and three days' operation of a paper mill makes costs prohibitive. The government subsidized cotton has been available to rag content mills at about 9 cents per pound delivered at the mill. That's a pretty low price for cotton when you think of the spot market at over 30 cents per pound.

"At one point, the Government was anxious to liquidate its tremendous accumulation of cotton acquired on loans that were never redeemed. That phase of the Government's operation is now over, since the Government has finally sold all of the cotton it had accumulated.

"The Government is still interested in this program because it wishes to develop new users of cotton for the time when cotton will not be supported by the Government with expensive price props—for the time when cotton will be grown economically in the United States and sold economically to the present users and to a host of new users.

"I say this because the Government's position in the cotton picture is in the process of change. It will be altered somewhat next year and radically changed the year after. Prior to the war, the Government supported cotton by making non-recourse loans of 52 percent of parity. With that support, cotton was selling at about 8 cents per pound.

"As part of the wartime legislation, the Government's support program for cotton was increased to 92.5 percent of parity. The Government laws requiring the support of cotton prices on this basis will terminate at the end of 1948.

"The present parity for cotton is 26 cents per pound and the Government is required to make loans at about 24 cents per pound. If the new crop is large enough, the market price for cotton may sink to this level from the present price of 33 cents.

"In 1948, however, as we approach the termination of the support program, anything can happen to cotton. We may see a free market for cotton or, if there is another support program for 1949, it probably will be more like the one we had before the war when the Government's support program was at 52 percent of parity. On the basis of present general prices, the loanable value for cotton would be about 13 cents.

"A technological revolution is taking place in the growing of cotton. Cotton growing and cotton picking are being mechanized. A cotton picking machine with one man will do the work of 70 men. Mechanized planting and growing have gone a long way. Mechanization of harvesting is getting underway and will make substantial headway in the next few years.

"The rag content paper industry is interested in cotton because it must find an adequate supply of fiber material at low cost if it is to continue in competition with other writing papers. The supply of cotton cuttings has recently been inadequate for the present production of rag content papers. In recent months, textile production has been increasing rapidly and it may be in the near future that the production of new cotton cuttings will be greater and the supply as well as demand will be in better balance.

"But the paper manufacturer still has some doubt about the future supply because of the introduction of synthetic fibers in the new types of textiles. There is a belief that for the long pull, the supply of cuttings suitable for papermaking may be relatively less rather than more. It is for this important basic reason that the rag content papermaker must look to some additional source of supply for his basic cotton material.

"Cotton is presently grown, graded, and marketed to meet the needs and tastes of the textile industry. It is our belief that cotton may be grown more economically if the minimum needs of the paper industry are uppermost in the plans of the grower. The lower grades of cotton for the textile industry are grown most economically in the high plains of Texas. It is our belief that special selection of seed to grow the type of cotton adequate for the paper industry will result in the largest yield per acre. Considerable progress has already been made in mechanization in this area as far as soil preparation, planting, and cultivation are concerned. However, mechanized harvesting is still in its infancy. It is our belief that cotton economically grown and harvested may result in qualities of cotton which may not meet the needs and tastes of the textile industry but will be suitable for fiber requirements of rag content mills.

"Probably new cotton cuttings will always be used by the high grade writing paper industry because they will always be cheaper than the standard grades of cotton. What the relationship of new cotton cuttings with the low end grades of cotton will be, is something that only the future can tell us."

Paperboard Men to Meet

CHICAGO — A meeting of the members and of the board of directors of National Paperboard Association has been called to be held at the Seaview Country Club, Absecon, N. J., on Thursday, April 10, and Friday, April 11.

IN THE PROCESSING OF WRITING PAPERS

Diamond

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- CAUSTIC SODA
- LIQUID CHLORINE

Always a good specification

DIAMOND ALKALI COMPANY

PITTSBURGH 22, PA., *and Everywhere*

Congress Opens Bids For Second Quarter

(Continued from page 8)

Coated Book

No. 38—450,000 lbs., 25x38—120; flat, cut any size, min. width 24 ins., max. width 48 ins.

Barton, Duer & Koch Paper Co. (Price at time of shipment.) 10.30c

No. 39—50,000 lbs., 25x38—100 and 120; rolls, 28½ and 38 ins. wide. (3-inch fiber cores).

Barton, Duer & Koch Paper Co. (100 lb. basis—price at time of shipment.) 9.94c

Barton, Duer & Koch Paper Co. (120 lb. basis—price at time of shipment.) 9.25c

Chemical Wood Mimeographed, White and Colored

No. 45—250,000 lbs., white, No. 40; flat, cut 28½x34½, 32½x42½ and 38x48½ ins., the grain: size 28½x34½ to run the 28½ inch way; size 32½x42½ to run the 42½ inch way; size 38x48½ to run the 38 inch way.

R. P. Andrews Paper Co. 9.21c

No. 46—150,000 lbs., blue, buff, green, pink and yellow, No. 40; flat, cut 32½x42½ and 38x48½ ins. Grains: Size 32½x42½ to run the 42½ in. way; size 38x48½ to run the 38 in. way. Min. order, one color, 10,000 lbs.

25% Mimeograph

No. 47—500,000 lbs., No. 40; flat, cut 28½x34½, 32½x42½, 34½x44, 38x48½, 40½x42½ ins.; the grain: size 28½x34½ to run the 28½ inch way; sizes 32½x42½ and 40½x42½ to run the 42½ inch way; size 38x48½ to run the 38 inch way.

Howard Paper Mills, Inc. (Aetna Paper Co. Division. Price at time of shipment. 200,00 lbs. only.) 15.77c

Old Dominion Paper Co. (Price at time of shipment.) 17.20c

Duplicator Copy Paper, Liquid Process, White and Colored

No. 49—40,000 lbs., pink, yellow, green and blue, No. 40; flat, cut 32x42 and 34x44 ins.; the grain to run lengthwise of the sheet.

Blue U S M O Safety Writing

No. 50—300,000 lbs., No. 32; rolls, 22 ins. wide, 24 ins. in diameter (3-inch fiber cores).

D. L. Ward Co. (150,000 lbs. only. Price at time of shipment.) 16.98c

Chemical Wood Writing, White and Colored

No. 52—50,000 lbs., white, No. 26; flat, cut any size, min. width 21 ins., max. width 48 ins.

D. L. Ward Co. (Price at time of shipment.) 14.82c

Stanford Paper Co. (Price at time of shipment.) 13.07c

No. 53—8,000,000 lbs., white, No. 32; flat, cut any size, min. width 21 ins., max. width 48 ins.

Whitaker Paper Co. (1,000,000 lbs. only.) 10.71c

D. L. Ward Co. (800,000 lbs. only. Price at time of shipment.) 11.98c

Cauthorne Paper Co. (Price at time of shipment. 200,000 lbs. only.) ..

R. P. Andrews Paper Co. (850,000 lbs. only.) 10.09c

Stanford Paper Co. (Price at time of shipment. 200,000 lbs. only.) .. 11.00c

No. 54—7,000,000 lbs., white, No. 40; flat, cut any size, min. width 21 ins., max. width 48 ins.

No. 55—150,000 lbs., white, No. 32; rolls, min. width 16 ins., max. width, 48 ins. (3-inch fiber cores).

Mead Sales Co. 9.71c

R. P. Andrews Paper Co. (150,000 lbs. only.) 9.07c

Stanford Paper Co. (150,000 lbs. only. Price at time of shipment.) .. 9.34c

No. 56—150,000 lbs., white, No. 40; rolls, min. width 16 ins., max. width 48 ins. (3-inch fiber cores).

Mead Sales Co. 9.13c

R. P. Andrews Paper Co. (150,000 only.) 8.48c

No. 58—1,000,000 lbs., blue, buff, cherry, green, pink, salmon and yellow, Nos. 32 and 40; flat, cut any size, min. width 21 ins., max. width 48 ins. Min. order, one color, 10,000 lbs.

Chemical Wood, Writing (Titanium Dioxide Filled)

No. 61—500,000 lbs., No. 32; flat, cut 34x44 ins.

Paper Corp. of U. S. (200,000 lbs. only.) 11.90c

Barton, Duer & Koch Paper Co. (Price at time of shipment.) 11.69c

50% Lithograph-Finish Map

No. 64—40,000 lbs., Nos. 32 and 40; flat, cut any size, min. width 22 ins., max. width 48 ins., the grain to run lengthwise of the sheet.

High Wet Strength Map

No. 68—350,000 lbs., No. 48; flat, cut any size, min. width 22 ins., max. width 48 ins.; grain to run lengthwise of the sheet.

50% White Chart Map, Lithograph Finish

No. 69—100,000 lbs., No. 72; flat, cut any size, min. width 22 ins., max. width 46 ins.; grain to run lengthwise of sheet unless otherwise specified.

Franklin Research Co. 23.00c

Chemical Wood, Manifold, White and Colored

No. 72—40,000 lbs., white, No. 18; flat, cut 21x32, 28x34, 32x42, 34x44 ins.,

50% Manifold White and Colored

No. 75—20,000 lbs., white, No. 14; flat, cut 38x48 ins. Min. order 5,000 lbs.

Barton, Duer & Koch Paper Co. (Price at time of shipment.) 35.00c

No. 76—100,000 lbs., white No. 18; flat, cut 21x32, 28x34, 32x42 and 34x44 ins.

Paper Corp. of U. S. 31.75c

R. P. Andrews Paper Co. (20,000 lbs. only.) 32.00c

Old Dominion Paper Co. (40,000 lbs. only.) 28.56c

No. 78—10,000 lbs., blue, buff, cherry, green, pink, salmon and yellow. No. 18; flat, cut 28x34 and 34x44 ins. Min. order, one color, 5,000 lbs.

Paper Corp. of U. S. (Not less than 5 Tons of a color.) 32.75c

Old Dominion Paper Co. 29.58c

50% White Glazed Manifold

No. 85—40,000 lbs., No. 16; flat, cut 32x42 ins. Min. order, 20,000 lbs.

Barton, Duer & Koch Paper Co. (Price at time of shipment.) 35.00c

25% Bond, White and Colored

No. 105—100,000 lbs., white, No. 26; flat, cut any size, min. width 21 ins., max. width 48 ins.

Barton, Duer & Koch Paper Co. (Price at time of shipment.) 22.95c

Howard Paper Mills, Inc. (Aetna Paper Co. Division) 22.26c

No. 106—300,000 lbs., white, No. 32; flat, cut any size, min. width 21 ins., max. width, 48 ins.

Howard Paper Mills, Inc. (Aetna Paper Co. Division. Price at time of shipment. 200,000 lbs. only.) 18.09c

No. 107—300,000 lbs., No. 32; flat, cut any size, min. width 21 ins., max. width 48 ins.

Howard Paper Mills, Inc. (Aetna Paper Co. Division. Price at time of shipment. 200,000 lbs. only.) 18.09c

No. 108—200,000 lbs., No. 32; flat, cut any size, min. width 21 ins., max. width 48 ins.

Barton, Duer & Koch Paper Co. (Price at time of shipment.) 18.65c

Howard Paper Mills, Inc. (Aetna Paper Co. Division. Price at time of shipment.) 18.09c

No. 109—800,000 lbs., No. 40; flat, cut any size, min. width 21 ins., max. width 48 ins.

Franklin Research Co. (400,000 lbs. only.) 18.95c

Howard Paper Mills, Inc. (Aetna Paper Co. Division. Price at time of shipment. 400,000 lbs. only.) 17.12c

No. 112—40,000 lbs., No. 26; blue, buff, cherry, green, pink, salmon and yellow; flat, cut 34x44 ins., min. order 5,000 lbs.

No. 113—100,000 lbs., blue, buff, cherry, green, pink, salmon and yellow, No. 32; flat, cut any size, min. width 21 ins., max. width 48 ins.

Howard Paper Mills, Inc. (Aetna Paper Co. Division. Price at time of shipment.) 18.81c

No. 114—150,000 lbs., blue, buff, cherry, green, pink, salmon and yellow, No. 40; flat, cut any size, min. width 21 ins., max. width 48 ins.

Howard Paper Mills, Inc. (Aetna Paper Co. Division. Price at time of shipment.) 17.84c

100% White Bond

No. 128—15,000 lbs., white, Nos. 32 and 40; flat, cut any size, min. width 16 ins., max. width 38 ins., minimum order, one substance, 2,000 lbs.

Barton, Duer & Koch Paper Co. (Number 32.) 34.15c

Barton, Duer & Koch Paper Co. (400,000 lbs. only. Number 40. Price at time of shipment.) 33.17c

Chemical Wood White Ledger

No. 150—250,000 lbs., No. 28 flat, cut any size, min. width 17 ins., max. width 48 ins.

D. L. Ward Co. (Price at time of shipment.) 12.27c

No. 151—150,000 lbs., No. 64; flat, cut any size, min. width 17 ins., max. width 48 ins.

25% Ledger, White and Colored

No. 154—75,000 lbs., white, No. 48; flat, cut 28x34, 32x42, 34x44 and 38x48 ins. Min. order, one color, 5,000 lbs.

Howard Paper Mills, Inc. (Aetna Paper Co. Division. Price at time of shipment.) 18.09c

No. 155—100,000 lbs., white, No. 64; flat, cut 28x34, 32x42, 34x44 and 38x48 ins. Min. order 5,000 lbs.

Franklin Research Co. 19.95c

Howard Paper Mills, Inc. (Aetna Paper Co. Division. Price at time of shipment.) 18.09c

No. 156—40,000 lbs., white, No. 88; flat, cut 28x34, 32x42, 34x44 and 38x48 ins. Min. order 5,000 lbs.

No. 158—40,000 lbs. blue, buff, cherry green, pink, salmon and yellow, No. 88; flat, cut 34x44 ins. Min. order, one substance, one color, 5,000 lbs.

Chemical Wood White and Colored Index

No. 183—200,000 lbs., white, 25½x30½—220 and 280; flat, cut 34x44 ins., with projecting colored-paper marker between each 100 sheets. Min. order, one weight, 10,000 lbs.

PLURAL ACTION . . .

Complete wax dispersion, Positive wax retention

SINGULAR RESULT . . .

Improved Sizing!

Laboratory tests effectively demonstrate what users confirm . . . that Nopco Wax Sizes impart all-round water resistance to paper, paperboard, and fiber insulation board products.

Yes, **IMPROVED SIZING,** because with Nopco* Wax Sizes, the finer-than-average particles (less than ½ micron) permit *complete and intimate dispersion* of the wax through the fiber mass.

IMPROVED SIZING, also, because Nopco Wax Sizes when precipitated by alum (their alum sensitivity is remarkable) adhere to the fibers and stay there, assuring you *positive wax retention.*

NOPCO WAX SIZES are offered in two forms—

Nopco 2251-B Wax Emulsifier for mills preferring to make their own wax size.

Nopco 2252 Wax Emulsion for mills preferring a ready-made size.

Write today for informative technical bulletins on Nopco 2251-B and Nopco 2252.

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Richmond, Calif.

NOPCO WAX SIZES

*Reg. U. S. Pat. Off.

BUT CAN I BUY IT?

Even though some NOPCO products are not now available in the desired volume, we are confident that the situation will gradually better itself. Meanwhile, we shall do our best to keep you informed of any developments. Here is a statement of the current situation on the NOPCO products advertised.

PRODUCT — NOPCO 2251-B WAX EMULSIFIER
NOPCO 2252 WAX SIZE

DELIVERY — Present customers' deliveries good, keeping pace with demands. Due to some tightness in raw materials, however, we are unable to accept new business at the moment, but are glad to submit samples for testing.

PRICE — Based on present costs of raw materials. Any decrease in such costs will immediately be reflected in our price.

OUTLOOK — Expect new installation to be completed shortly. This will increase production facilities.

EVOLVED THROUGH RESEARCH NOPCO

50% Index, White and Colored

No. 189—400,000 lbs., white, 25½x30½—220 and 280; flat, cut 32x42 and 34x44 ins., with projecting colored-paper marker between each 100 sheets. Min. order, one weight, 10,000 lbs.

Barton, Duer & Koch Paper Co. (Price at time of shipment.) 21.15c

No. 191—100,000 lbs., blue, buff, cherry, fawn, green, pink, salmon and yellow; 25½x30½—220 and 280; flat, cut 34x44 ins., with projecting colored-paper marker between each 100 sheets. Min. order, one color, one weight, 5,000 lbs.

Barton, Duer & Koch Paper Co. (Price at time of shipment.) 21.90c
R. P. Andrews Paper Co. (Price at time of shipment.) 19.50c

100% White Index

No. 196—40,000 lbs., 25½x30½—250; flat, cut 20½x30½ ins.

Barton, Duer & Koch Paper Co. (Price at time of shipment.) 33.46c

Coated Cover Paper, White and Colored

No. 200—40,000 lbs., 20x26—130; white, flat, cut 26½x41 and 34x44 ins.; grain to run lengthwise of the sheet. Min. order 5,000 lbs.

Perkins Goodman Co. (6,000 lb. shipments.) 13.15c
Perkins Goodman Co. (10,000 lb. shipments.) 12.90c
Perkins Goodman Co. (10,000 lb. shipments.) 12.80c

Antique-Finish Cover, White and Colored

No. 203—80,000 lbs., 20x26—100; blue, buff, dawn, quaker drab, terra cotta, gray, brown, green, gobelin blue, granite, tea and yellow; flat, cut 25½x39, with projecting colored-paper marker between each 500 sheets. Min. order, one color, 5,000 lbs.

R. P. Andrews Paper Co. (Price at time of shipment.) 11.88c

Cloth Lined Cover, White and Colored

No. 205—45,000 sheets, 20x26—136; white, brown and quaker drab; flat, cut 36x38 ins.

50% Laid Cover, Colored

No. 206—15,000 lbs., blue, cream white, gray and green, 20x26—130 and 200; flat, cut 25¼x39 and 28x41 ins., with projecting colored-paper marker between each 500 sheets. Min. order, one color, 2,000 lbs.

R. P. Andrews Paper Co. (Price at time of shipment.) 18.88c

Wood Manila

No. 208—150,000 lbs., 24x36—80 and 100; flat, cut 25x38, 32x42 ins., with projecting colored-paper marker between each 500 sheets.

No. 2 Kraft

No. 217—200,000 lbs., 24x36—80 to 160; flat, cut any size, in wrapped bundles.

No. 218—80,000 lbs., 24x36—80 to 160; cut any size, folded (25 sheets per fold), in wrapped bundles.

No. 219—100,000 lbs., 24x36—80 to 160; rolls, min. width 9 ins., max. width 48 ins., wound on wodden plugs, 1½ inch hole, or on 3-inch fiber cores as may be specified.

White Gummed

No. 252—100,000 sheets, No. 40; flat, cut 22x34 ins., min. order 25,000 sheets.

Stanford Paper Co. (Per M sheets.) $20.60

High-Finish Chemical Wood Manila Tag

No. 271—40,000 lbs., 24x36—280; flat, cut any size, min. width, 24 ins., max. width, 38 ins.

Paper Corp. of U. S. (Price at time of shipment.) 13.50c

Railroad Board, White and Colored

No. 301—20,000 sheets, white, flat, 22x34 ins., 4-ply, each 100 sheets fully banded. Min. order 10,000 sheets.

No. 303—20,000 sheets white; flat, 22x34 ins., 14 ply, each 50 sheets fully banded. Min. order 5,000 sheets.

No. 304—20,000 sheets, ash gray, green, orange and red, flat, 22x34 ins., 4-ply, each 100 sheets fully banded. Min. order, one color, 5,000 sheets.

No. 305—5,000 sheets, buff, flat, 22x28 ins., 14-ply, each 50 sheets fully banded. Min. order 5,000 sheets.

Wood Cardboard, Colored

No. 306—100,000 lbs., buff; 22½x28½—150; rolls, 20 ins., wide (3-inch fiber cores).

No. 307—100,000 lbs. buff; 22½x28½—150; flat, cut 32x42 ins.

No. 309—200,000 lbs., blue, buff, gray, green, melon, pink and yellow; 22½x28½—184; rolls, 20 inches wide (3-inch fiber cores).

Chemical Wood Tan Board

No. 310—50,000 lbs., 22½x28½—200; flat, cut 19½x28½, 25x38 and 34x44 ins.

Paper Corp. of U. S. (Price at time of shipment.) 14.50c
R. P. Andrews Paper Co. (Price at time of shipment.) 12.86c

United States Postal Card Paper

No. 325—2,000,000 lbs., 22½x28½—188; rolls, 33 ins. wide, 36 ins. in diameter (6-inch iron or fiber cores).

Whitaker Paper Co. (Total tonnage 3,000,000 lbs. incl. lots 53, 325, 326, 327.) 7.67c
R. P. Andrews Paper Co. (Total tonnage 2,200,000 lbs. incl. lots 325, 326 and 327.) 7.55c

No. 326—2,000,000 lbs., 22½x28½—188; rolls, 33 ins. wide, 36 ins. in diameter (6-inch iron or fiber cores).

Whitaker Paper Co. (Total tonnage 3,000,000 lbs. Lots 53-327 incl.) ... 7.67c
R. P. Andrews Paper Co. (Total tonnage 2,200,00 lbs. Lots 53-327 incl.) 7.55c

No. 327—2,000,000 lbs., 22½x28½—188; rolls, 33ins. wide, and 36 ins. in diameter (6-inch iron or fiber cores).

Whitaker Paper Co. (Total tonnage 3,000,000 lbs. Lots 53-327 incl.) ... 7.67c
R. P. Andrews Paper Co. (Total tonnage 2,200,000 lbs. Lots 325, 326, 327.) 7.55c

Postcard Paper

No. 330—150,000 lbs., 22½x28½—188; flat, cut 33x56 ins.

Pressboard, Colored

No. 352—50,000 sheets gray; flat, cut 30x36, thickness .0300 in. Min. order 5,000 sheets.

Newsboard

No. 360—400,000 lbs., 26x38 ins., No. 100; flat, cut any size, min. 21x32 ins., max. 40x52½ ins. (To be trimmed square on four sides.)

Binder's Board, No. 1 Quality

No. 366—40,000 lbs., flat, to trim 25x30 ins., No. 16, 18, 20, 25, 30 and 40.

No 367—40,000 lbs., 25¾x30¾ ins., Nos. 12 and 20; flat, to trim 34x44 ins.

Binder's Board, Best Quality

No. 368—40,000 lbs., flat, to trim 20x30 ins. and 22x28 ins., Nos. 18, 20, 25, 30, 35, 40 and 45. Min. order 5,000 lbs.

Consolidated Paper Co. 7.82c

Chestnut Cover Board

No. 369—40,000 lbs., flat, to trim 25x30 ins., Nos. 17, 19, 21, 25, 31 and 41.

Mead Sales Co. (Caliper .060 and above.) 5.80c
Mead Sales Co. (Caliper .050 to .060.) 6.175c

No. 370—400,000 lbs., flat, to trim 25¾x37¾ ins., Nos. 16, 19, 24 and 31.

Mead Sales Co. (Caliper .060 and above.) 5.80c
Mead Sales Co. (Caliper .050 to .060.) 6.175c

N.P.T.A. Completes Its Convention Program

(Continued from page 28)

Survey Report on Fine Paper Merchants' Operations in 1946 illustrated by charts, J. H. Londergan.
Discussion.

5:00 P. M. Wrapping Paper Governing Committee ..... Assembly Rooms J K

5:00 P. M. Fine Paper Governing Committee .... Pillement Suite

8:30 P. M. Board of Directors, President G. E. Carpenter presiding.. .....Assembly Rooms L M

WEDNESDAY, APRIL 2

9:00 A. M. Conference of National Counsel with Officials of Local Associations, Assembly Room M, 4th floor.

10:00 A. M. WRAPPING PAPER DIVISION MEETING, Vice-President R. G. Luff presiding. Jade Room
Speakers: H. S. Daniels, Union Bag & Paper Corp.; L. E. Croy, Marathon Corporation; F. K. Doscher, Lily-Tulip Cup Corp.
"Is a Price Book Good Business?" W. B. Killhour.
Report of Assistant Secretary, W. G. Leathers.
Survey Report on Wrapping Paper Merchants' Operations in 1946, illustrated by charts, J. H. Londergan.
Discussion.

2:30 P. M. ANNUAL MEETING, President G. E. Carpenter presiding.. ..... Jade Room
Report of Board of Directors.
Report of Treasurer, J. O. Bulkley.
Report of Executive Secretary.
Necrology.
Address of Counsel, Congressman J. K. Javits.
Nomination and Election of Officers.
Adjournment of Convention.

Here's why UNIFORM THICKNESS *OF STAINLESS CLADDING is assured*

Hot rolling Lukens Stainless-Clad Steel on the 206" Mill, world's largest plate mill. In this operation, the stainless steel and the backing plate are permanently and uniformly bonded.

This picture shows a solid stainless steel insert being placed on a carbon steel backing plate – one of the assembly steps, preparatory to hot rolling, in the production of Lukens Stainless-Clad Steels. The thickness of each component has been pre-determined to assure the required uniform percentage of cladding to total plate thickness in the finished clad steel plate.

Precision assembly and the high, uniform rolling pressure, employed to reduce and bond the components, give positive control over the uniformity of cladding thickness. There's no guesswork about it!

Lukens Stainless-Clad Steels are usually furnished in 10% or 20% clad, but percentages from 5% to 50% can be produced.

Any standard specification stainless, including types 410, 430, 304, 316, 347 and others, can be supplied in plates from 3/16" to over 3" thick, or up to 162" wide; also in formed heads in all styles and sizes to over 18' in diameter.

Beginning with Nickel-Clad Steel 17 years ago, Lukens now manufactures a complete line of clad steels produced by the same process. Each of these clad steels offers the corrosion resistance and product protection of the solid metal at substantial savings in cost.

★

Additional information on Lukens Stainless-Clad Steels is offered in the new Bulletin 338; on Lukens Nickel-Clad, Inconel-Clad and Monel-Clad Steels in Bulletin 255. Copies of these Bulletins will be sent on request.

★

LUKENS
Nickel-Clad Stainless-Clad
Inconel-Clad Monel-Clad
STEELS
★

LUKENS STEEL COMPANY
World's Largest Plate Mill
374 Lukens Building ★ Coatesville, Pa.
Cable Address: Lukens

Object to State Timber Control

MADISON, Wis. — The Wisconsin Farmers' Union, at its annual state convention here last week, went on record as opposed to a measure in the state legislature to give the state authority to regulate timber cutting on privately owned land, a proposal which has the strong support of the Wisconsin paper industry. The Farmers' Union also voted to make a study of the newsprint situation, with a view toward possible cooperative ownership of a paper mill.

Advawax 2575 Dissolves Vistanex in Waxes

NEW YORK—Advance Solvents and Chemical Corporation offers Advawax 2575 as a ready answer to the problem of dissolving Vistanex in waxes. Advawax 2575 is comprised of 25 percent by weight of Vistanex Polybutene high molecular weight and 75 percent by weight of paraffin wax 133-135°F. melting point. It will melt into additional hot wax readily with a minimum of heat and agitation. Thus, Advawax 2575 provides an easy, simple, and economical way of incorporating small amounts of Vistanex Polybutene into paraffin and other waxes. Reportedly, easily calculated small amounts of Advawax 2575 are simply melted into large amounts of straight paraffin wax without the necessity of using expensive kneaders or mixers, which would otherwise be required.

Heco Features Business Builder

CHICAGO—The Heco Envelope Company is making good use of an attractive and speedy "business builder" in the form of a return envelope flier described as "An aid for the busy envelope buyer." All that is necessary is for the envelope buyer to enclose a sample of the envelope needed now or at some future date, and indicate in the proper space provided, whether it is an order or an inquiry for quotation. A third space is provided wherein the envelope buyer may ask for suggestions and improvements on the sample envelope he has enclosed.

Bristol Tachometers Record Paper Speed

WATERBURY, Conn. — The Bristol Company is becoming widely known to paper mills through its installation of Bristol Recording Tachometers which record paper speed through a paper machine. These instruments which can be furnished to read in inches per minute, revolutions per minute, minutes baking time, pieces per hour, or any other unit of speed measurement are proving particularly useful to manufacturers of high grade papers where exactness is apparent. Manufacturers of fine crepe and tissue papers are able to adjust machine speeds to obtain the exact degree of creping for each particular grade of paper being run through the use of these recording tachometers.

Truttschel Heads Chemists

APPLETON, Wis. — Paul E. Truttschel, research chemist of the Appleton Coated Paper Company, has been elected chairman of the Northeast Wisconsin section of the American Chemical Society, succeeding Dr. Nelson E. Rodgers of the Western Condensing Company, also of Appleton.

Averill J. Wiley, technical director of the Sulfite Pulp Manufacturers' Research League, Inc., Institute of Paper Chemistry, was chosen vice-president, and Louis G. Veler, research chemist of Kimberly-Clark Corporation, Neenah, secretary-treasurer.

Dr. Harry F. Lewis, dean of the Institute of Paper Chemistry, and Dr. Donald W. Davis, director of research for food packaging materials and packages of Marathon Corporation, Menasha, were named to the society's national council.

Mr. Truttschel received the B.S. degree in 1940 from Marquette University, Milwaukee. Shortly afterward he joined the staff of the Institute of Paper Chemistry. He has been a research chemist with the Appleton Coated Paper Company since August, 1946.

Crane Awards $270 For Employe Hints

DALTON, Mass.—Officials of Crane & Company have released the names of employees whose suggestions were accepted by the company during January and February. A total of 31 suggestions were accepted, and $270.25 was paid. Individual awards ranged from $5 to $45.50.

Employees whose suggestions were accepted are: Edward C. Bills, William Brown, Herbert Collins, George H. Cushine, Edward P. Elser, George K. Fillio, Joseph Flaherty, James E. Fraley, James H. Garvey, Norman Goddermote, Miss Margaret Kelley, William Mawhinney, George Messenger, Philip A. Morrison, William Munn, John O'Loughlin, Bart J. Cooper, Robert Rider, Kenneth A. Ripley, William Robins, Thomas Rochelo, Gardner Rudd, Howard J. Schnopp, Harry W. Smith, Miss Margaret Tone and Ralph F. Williams.

Crane Places Cashing At Kansas City

PITTSFIELD, Mass.—Chester Cashing has been named assistant manager of the Eaton Paper Company's Kansas City, Mo., prinscript department. He already has assumed his duties. Cashing became affiliated with the paper corporation January 1 after resigning his position as a production expediter at the Pittsfield works of the General Electric Company. Prior to receiving the Kansas City appointment, he took the company's training course.

OBITUARY

Frank E. Taylor

HOLYOKE, Mass.—Frank E. Taylor, 62, former Holyoke paper manufacturer, died recently at the Atlanta-Biltmore hotel at Atlanta, Ga., of coronary thrombosis. He left Holyoke on a motor trip south and had reached Atlanta where he was dining with friends when he became ill. After dinner he returned to his hotel and died shortly afterwards.

Taylor entered the papermaking business when a young man and had been connected with that industry most of his life. Shortly after leaving school he joined the Taylor-Burke Paper Co., which was founded by his brother, the late James Taylor. When this firm became the Taylor-Logan Paper Co. he became vice-president, secretary and general manager. The company sold out in 1921.

His wife died in 1946. He is survived by a sister and several nieces and nephews.

Roland McDougall

HOLYOKE, Mass. — Roland B. McDougall, 57, former executive of the American Writing Paper Corp., died at his home at Mt. Tabor, N. J., after an illness that has confined him for the greater part of the last two years.

He was a salesman for the Mack Elliott Paper Co. in St. Louis in 1923 when he resigned to join American. He was placed in charge of the paper specialty department and in 1929 he was named assistant general sales manager. He left that company in 1934 to become sales manager for the Collins Paper Manufacturing Co. of North Wilbraham. The following year he left Collins and was later with the International Paper Co. and Waterfalls Paper Co.

Barnard D. Shattuck

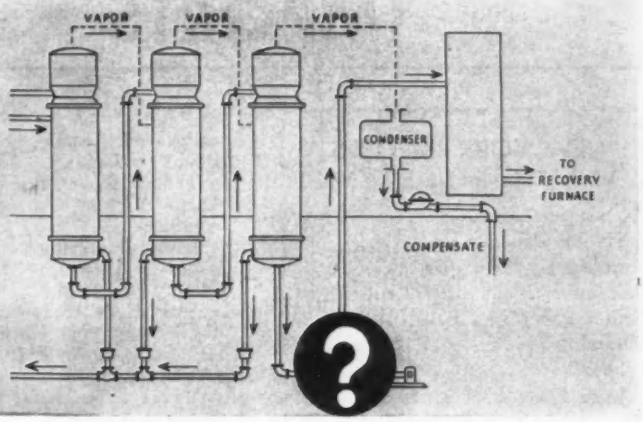
SYRACUSE, N. Y.—Barnard D. Shattuck, 67, an associate of the Judd Paper Company of Holyoke, Mass., and for many years outstanding in the civic and fraternal life of Syracuse, died suddenly here. Mr. Shattuck was for many years a moving factor in work of the Community Chest and Red Cross. He spent his early life in Massachusetts and came to Syracuse 43 years ago.

Arthur R. Root

HOLYOKE, Mass.—Arthur R. Root, retired office and traffic manager of the American Pad & Paper Co., died recently after a long illness. He was 79 and had been associated with the American Pad and Paper concern for fifty years. He retired eight years ago.

PROBLEM: A Paper Mill requires a pump for Black Liquor to Recovery Furnace Storage. Liquor contains 55% solids, 220°F., 1.34 specific gravity, 250 G.P.M., 50 ft.

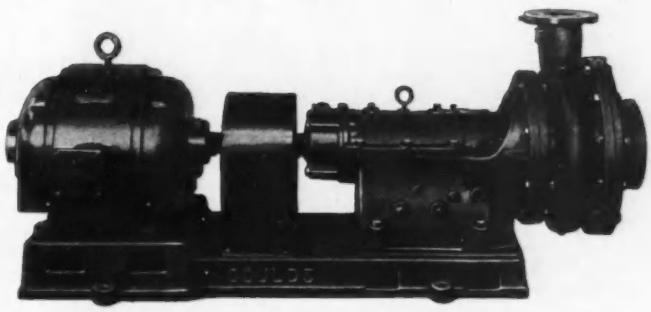
Which Goulds Pump is *the* Pump for *the* Job?



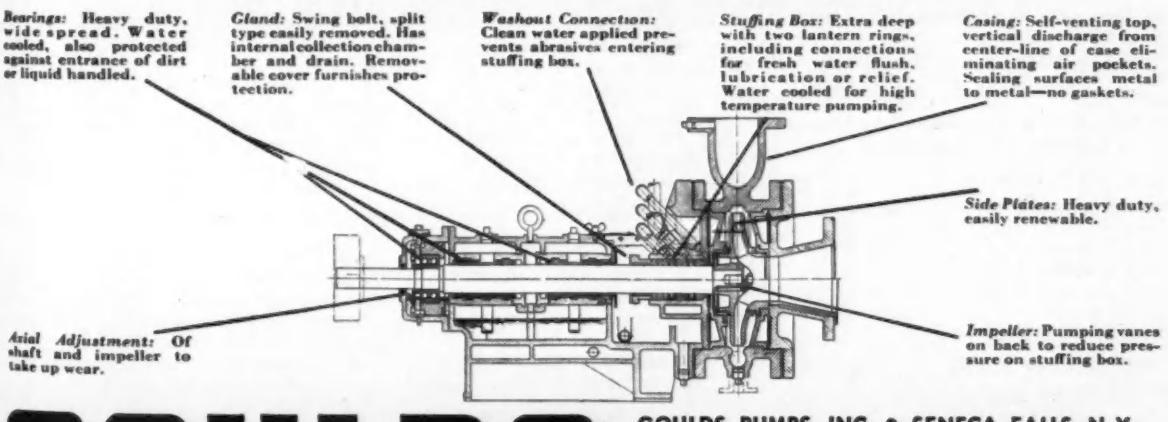
SOLUTION: GOULDS HEAVY DUTY CHEMICAL PUMP, FIG. 3605

This pump was designed for just such rugged 24-hour-a-day service. The 3″ size in 2-3% nickel and stainless steel trim with full open impeller and driven by a 7½ H.P., 1150 R.P.M. motor, will do a most efficient and trouble-free job.

Fig. 3605 is also available in stainless steel, all iron, all bronze or any of several other materials. It can also be supplied with semi-enclosed or fully enclosed impellers. Capacities from 50 to 1500 G.P.M. with heads up to 220 ft. When you have a pump problem, call or write pump headquarters or your nearest Goulds office.



HERE'S WHY THE GOULDS HEAVY DUTY CHEMICAL PUMP IS EFFICIENT AND DEPENDABLE


Bearings: Heavy duty, wide spread. Water cooled, also protected against entrance of dirt or liquid handled.
Gland: Swing bolt, split type easily removed. Has internal collection chamber and drain. Removable cover furnishes protection.
Washout Connection: Clean water applied prevents abrasives entering stuffing box.
Stuffing Box: Extra deep with two lantern rings, including connections for fresh water flush, lubrication or relief. Water cooled for high temperature pumping.
Casing: Self-venting top, vertical discharge from center-line of case eliminating air pockets. Sealing surfaces metal to metal—no gaskets.
Side Plates: Heavy duty, easily renewable.
Axial Adjustment: Of shaft and impeller to take up wear.
Impeller: Pumping vanes on back to reduce pressure on stuffing box.

GOULDS

GOULDS PUMPS, INC. • SENECA FALLS, N.Y.

PUMPS, INC.

the PUMP FOR the JOB

IMPORTS

NEW YORK IMPORTS

WEEK ENDING MARCH 15, 1947

Newsprint	6584 rolls
Printing Paper	2 cs.
Surface Coated Paper	2 cs.
Wrapping Paper	602 rolls, 7 cs.
Filter Paper	32 cs.
Drawing Paper	3 cs.
Photo Paper	120 cs.
Tissue Paper	11 cs.

NEWSPRINT

N. Y. Journal American, Markland, Liverpool, N. S., 1158 rolls.
N. Y. Tribune, Markland, Liverpool, N. S., 1906 rolls.
World Telegram, Markland, Liverpool, N. S., 606 rolls.
Brooklyn Eagle, Markland, Liverpool, N. S., 825 rolls.
S. S. Hoffman, Markland, Liverpool, N. S., 327 rolls.
Clinton Paper Corp., Markland, Liverpool, N. S., 72 rolls.
Richmond Newspapers (Richmond, Va.), Markland, Liverpool, 1690 rolls.

PRINTING PAPER

S. H. Pomerance, Augustana Victory, London, 2 cs.

SURFACE COATED PAPER

Gevaert Co. of America, Inc., Ogelthorpe Victory, Antwerp, 2 cs.

WRAPPING PAPER

The Borregaard Co., Inc., Gripsholm, Gothenburg, 3 rolls.
Green Kriegsman Paper Co., Gripsholm, Gothenburg, 599 rolls (sulphite).
Meadows Wye & Co., Augustana Victory, London, 7 cs. (waxed).

FILTER PAPER

H. Reeve Angel & Co., Inc., Augustana Victory, London, 30 cs.
Fisher Scientific Co., Augustana Victory, London, 1 cs.
Karr Ellis & Co., Augustana Victory, London, 1 cs.

DRAWING PAPER

H. Reeve Angel & Co., Inc., Augustana Victory, London, 3 cs.

PHOTO PAPER

J. J. Gavin & Co., Augustana Victory, 1 cs.
E. I. du Pont de Nemours & Co., Augustana Victory, London, 75 cs. (raw base).
Lep Transport, Augustana Victory, London, 44 cs. (raw base).

TISSUE PAPER

Drueding Bros. Co., Pres. Monroe, Genoa, 11 cs. (caps).

RAGS, BAGGINGS, ETC.

Chase National Bank, Extavia, Venice, 216 bls. old rags.
Continental Bank Trust Co., Oglethorpe Victory, Antwerp, 169 bls. bagging.
Royal Manufacturing Co., Ogelthorpe Victory, Antwerp, 20 bls. cotton waste.
W. Steck & Co., Marwarra, Calcutta, 70 bls. hemp rope cuttings.
J. A. Manning Paper Co., Augustana Victory, London, 154 bls. old drab webbing; 3 bls. new cotton canvas rags.
Schimmel Trading Corp., Pres. Monroe, Bombay, 100 bls. cotton waste.
Brandwein Mazur Co., Pres. Monroe, Bombay, 100 bls. cotton waste.
(———), Pres. Monroe, Bombay, 180 bls. cotton waste.
Lush Cotton Products Co., Pres. Monroe, Bombay, 50 bls. cotton waste.
Textile & Paper Supply Corp., Pres. Monroe, Alexandria, 68 bls. cotton waste.
D. Bennedetto, Inc., Pres. Monroe, Alexandria, 44 bls. old colored rags; 46 bls. old white cotton rags.
E. J. Keller Co., Inc., Pres. Monroe, Naples, 53 bls. dark cotton rags.
A. W. Fenton Co., Pres. Monroe, Genoa, 182 bls. dark cotton rags.
Continental Bank Trust Co., Pres. Monroe, Leghorn, 135 bls. rags.
National City Bank, St. Tropez, Marseilles, 200 bls. rags.
O'Brien Products, Inc., Fernbank, Shanghai, 600 bls. cotton waste.
New England Waste Co., Fernbank, Shanghai, 300 bls. cotton waste.
Riverside Mills, Fernbank, Shanghai, 150 bls. cotton waste.
Padawer Corp., Fernbank, Shanghai, 100 bls. cotton waste.

WOODPULP

Price & Pierce, Ltd., Norefjord, Stavanger, 250 bls. prime bleached sulphite pulp.
Bulkley Dunton Pulp Co., Gripsholm, Gothenburg, 3048 bls. dry sulphite pulp.

BOSTON IMPORTS

WEEK ENDING MARCH 15, 1947

Andrews Paper Co., Ogelthorpe Victory, Antwerp, 2 cs. parchment paper.
Atlantic Gelatine Co., Ogelthorpe Victory, Antwerp, 504 bls. picker waste.

George Irwin Named

QUINCY, Ill.—A paper trade executive, George Irwin of the Irwin Paper Company, has been selected by the Quincy, Illinois, Chamber of Commerce as the "Young Man of the Year." The Quincy organization selected the young assistant secretary-treasurer of the paper jobbing firm, for doing the most outstanding job for his community during the past year. He is 25 years of age.

Plan Improvements At Woodfibre Mill

VANCOUVER, B. C.—A large expansion program, which will save both in wood consumption and operating costs, has been set underway by British Columbia Pulp & Paper Company, Limited. Officials report that at the Woodfibre mill, on Howe Sound, about 32 miles north of Vancouver, improvements include the installation of a specially-adapted hydraulic barking plant, a whole log chipper to take logs up to 40 inches in diameter, modern high pressure boilers and additions to electric power generating capacity.

These improvements, which will step up capacity and cut costs, are expected to be largely completed and in operation by the end of this year.

Woodfibre is one of the two mills owned by the company. The other is at Port Alice, Vancouver Island.

As a result of a $1,500,000 improvement program just prior to the war, products of both mills were stepped up in quality to the highest grades of rayon and bond pulps. Extensions made then and later increased combined mill capacity to the present total production of 135,000 tons a year.

These two mills are the only ones in British Columbia equipped to produce special quality dissolving pulp required for the manufacture of rayon yarns and staple fibre, officials report.

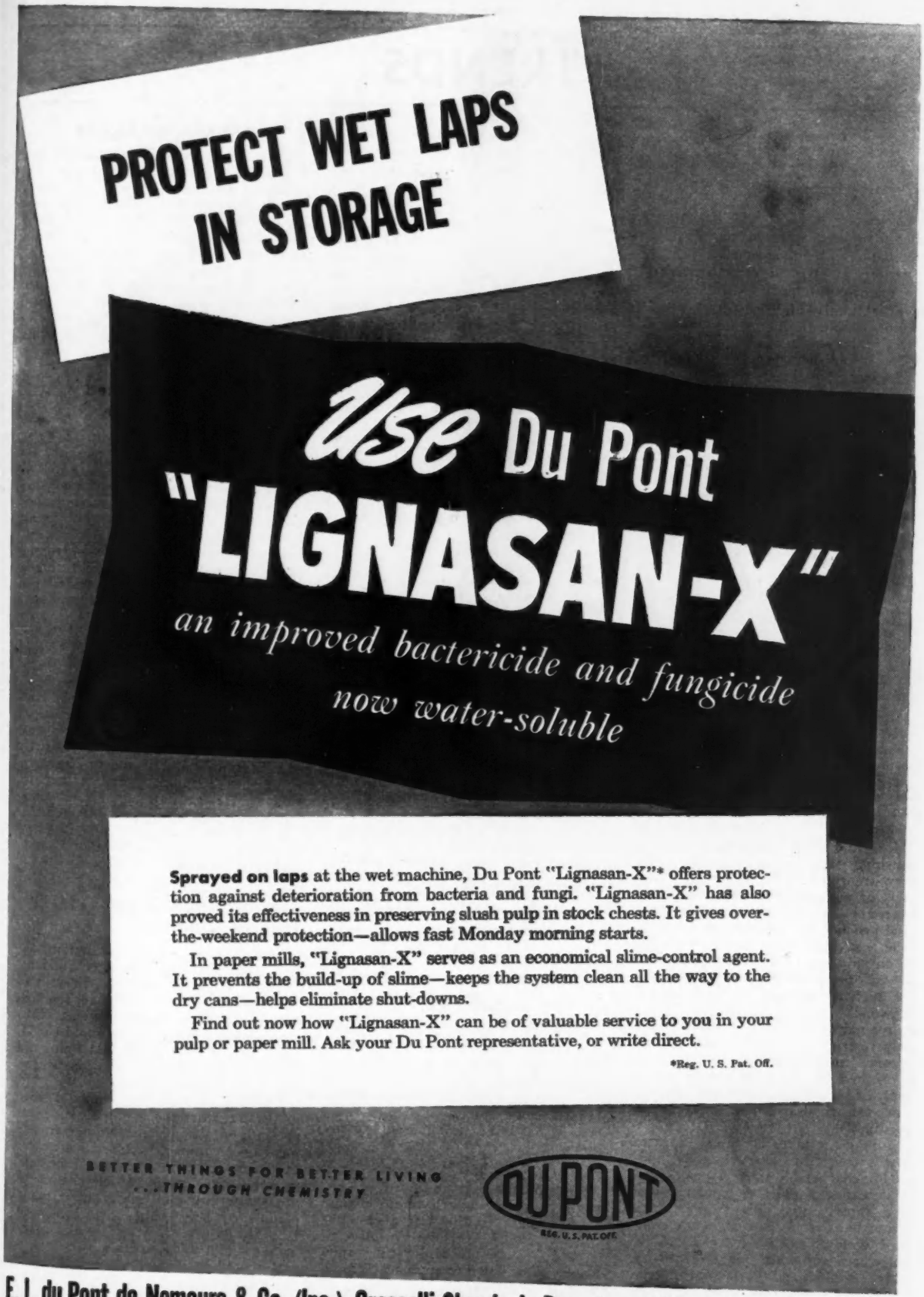
Despite the loggers strike last year average daily rate of production for the entire period was at about the same level as 1945, or about 80 percent of capacity.

Abitibi Aims to Replace "Missing Generation"

TORONTO — "Canada has a missing generation," said D. W. Ambridge, president and general manager of the Abitibi Power & Paper Co., Ltd., this week when stating that his company will put into effect a special educational plan to offset this loss to Canadian business.

"This missing generation is between the ages of 30 and 40 and has been caused by the depression and the war which followed it so closely," he said. "During this period, Canadian youth did not have the opportunity of acquiring the industrial experience and skills necessary to allow them to succeed to their rightful places in Canadian industry."

Mr. Ambridge said this loss was more than a loss to industry—it was a loss to Canada. In the pulp and paper industry, which is the largest in Canada, future growth will depend on the speed with which the "missing generation" can be replaced. To the end that Abitibi shall do its part, Mr. Ambridge said that a large class of engineering graduates has already been enrolled in the company's special school in Sault Ste. Marie.


PROTECT WET LAPS
IN STORAGE
Use Du Pont
"LIGNASAN-X"
an improved bactericide and fungicide
now water-soluble
Sprayed on laps at the wet machine, Du Pont "Lignasan-X"* offers protection against deterioration from bacteria and fungi. "Lignasan-X" has also proved its effectiveness in preserving slush pulp in stock chests. It gives over-the-weekend protection—allows fast Monday morning starts.
In paper mills, "Lignasan-X" serves as an economical slime-control agent. It prevents the build-up of slime—keeps the system clean all the way to the dry cans—helps eliminate shut-downs.
Find out now how "Lignasan-X" can be of valuable service to you in your pulp or paper mill. Ask your Du Pont representative, or write direct.
*Reg. U. S. Pat. Off.
BETTER THINGS FOR BETTER LIVING
...THROUGH CHEMISTRY
DU PONT
REG. U.S. PAT. OFF.
E. I. du Pont de Nemours & Co. (Inc.), Grasselli Chemicals Department, Wilmington 98, Delaware

TRENDS

Office of the PAPER TRADE JOURNAL, Wednesday, March 19, 1947.

Shipments of most converted paper products continue very strong despite transportation difficulties and a weakened source of paper and board supplies to independent converters. Paper merchants and converters are currently reporting offers of kraft paper, tissue, manifold, toilet tissue and napkins at exorbitantly high prices. In most instances both the merchants and converters are declining these unsound prices. While such speculation involves only a very small percentage of total sales its presence has a cancerous effect on a tight market.

The index of general business activity for the week ended March 8 declined to 144.2 from 147.5 in the previous week, compared with 127.9 for the corresponding week in 1946. The index of paperboard production was 178.3, compared with 181.7 in the preceding week and with 157.6 for the corresponding week in 1946.

Paper production for the week ended March 8 was estimated at 104.5 percent, compared with 108.5 for the preceding week, with 103.4 for the corresponding week in 1946, with 87.7 for 1945, with 95.0 for 1944, and with 89.8 percent for the corresponding week in 1943.

Paperboard production for the week ended March 8 was 102.0 percent of capacity, compared with 102.0 percent for the preceding week, with 99.0 percent for the corresponding week in 1946, with 94.0 for 1945, with 95.0 for 1944, and with 93.0 percent for the corresponding week in 1943.

More and more paper mills are establishing tree farms of their own. They are reported to be buying large tracts of non-agricultural lands, partly covered by second growth, for pulpwood production. Advantages are said to be a savings of as much as $5 per ton on pulp logs; preparedness against any unforeseen emergency in the future such as another war cutting off pulpwood imports; or preparedness against pulpwood export countries suddenly restricting shipments out of the country. Such programs will provide the United States with a continuous supply of pulpwood and steady employment for thousands of workers in paper mills.

Normally it takes 26 to 30 years to grow a tree from a seedling to pulpwood of marketable size. Aspens, commonly called popple, or poplar, grow more rapidly than pines and reach marketable size in 15 to 20 years, compared with 25 to 30 years for jack, Scotch, red and white pines. Until recently popples and jack pines were considered "weed trees," now they are some of our leading pulpwood trees. Both species reproduce themselves if forest fires are kept out or controlled and that is why they were previously considered weed trees until pulpwood uses were found for them.

There exists in the United States some three hundred and thirty million acres of so-called commercial forest land. On the basis of present consumption of pulpwood available from domestic sources, not over forty million acres would be required to bring growth and drain into balance. Official figures indicate that some 14,800,000 acres are now owned by paper and pulp companies. Of this acreage some 82 percent is classified as being under reasonably satisfactory forest management. The tremendous acreage that is being acquired by companies within the industry is indicative of the interest and appreciation of management of the importance of future wood supplies.

Wood Pulp

Current shipments of Canadian market pulp to the United States are reported steady, however, any increase in Canadian pulp production and exports to this country will be contingent on deliveries of machinery, an improvement in the available supply of woods labor and upon first satisfying the raw material requirements of the Canadian paper industry.

Rags

Old domestic cotton rags continue to show more strength than new domestic cotton cuttings. Paper mills are actively buying repacked miscellaneous thirds and blues at $3 f.o.b. shipping point plus dealer's commission. No. 1 whites repacked remain around the $5 level, with No. 1 whites miscellaneous at $4.25. No. 1 roofing rags continue $2.20.

Old foreign rags were active with linsey garments $4.50 to $5 f.o.b. New York. Medium light prints were reported at $5.25 to $5.75; checks and blues at $4.25.

Waste Paper

No. 1 white ledger at $80 to paper mills f.o.b. New York featured an active market this week, while new Manila envelope cuttings at $70 to $75 were also reported as strong. Extra Manilas were steady at $40. Mixed books at $22 to $25 found a good many takers.

Twines

Paper mills report an improved supply of twines with little or no change in quotations. In the soft fibers, unpolished paper makers remain close to the 26c level f.o.b. mills; tube rope around 27¾c; and wrapping at 33½c. Unpolished cottons are still strong at the 70c level. Hard fiber polished hemps are currently offered at 63c.

Old Rope and Bagging

Mills expressed fair demand for No. 1 domestic gunny at $4.40 per 100 pounds f.o.b. New York in an otherwise listless market. Despite the easing up of demand offerings of light wool tares at $4.60, and heavy wool tares at $5 were taken up.

Steady demand for old rope continues with mixed strings at $1.75 per 100 pounds f.o.b. New York. Jute strings remain $5, domestic Manila rope $5.75 and No. 1 sisal strings $4.50.

Job Evaluation Discussed By Chicago Paper Men

CHICAGO—"You and your job" was the subject of the panel discussion arranged for its members by the Chicago Professional Paper Group. The panel program was held in conjunction with the March 17 meeting in the dining rooms of the Chicago Bar Association. Leading authorities in the personnel field discussed the process of fitting a job and the person and the techniques involved in successful job analysis, personnel selection and evaluation of top executives. Speakers included Ralph H. Landes, Joseph E. King, Ph.D., and Fred A. Replogle, Ph.D. Mr. Landes is co-author of the book entitled "Occupational Rating Plan" and resident head of Wage Practices Organization, Western Electric Company. Dr. King is director of research of International Business Research while Dr. Replogle is a partner of Rohrer, Hebler and Replogle, Psychological Consultants to Management. The program was under the supervision of F. D. Long, Container Corporation of America.

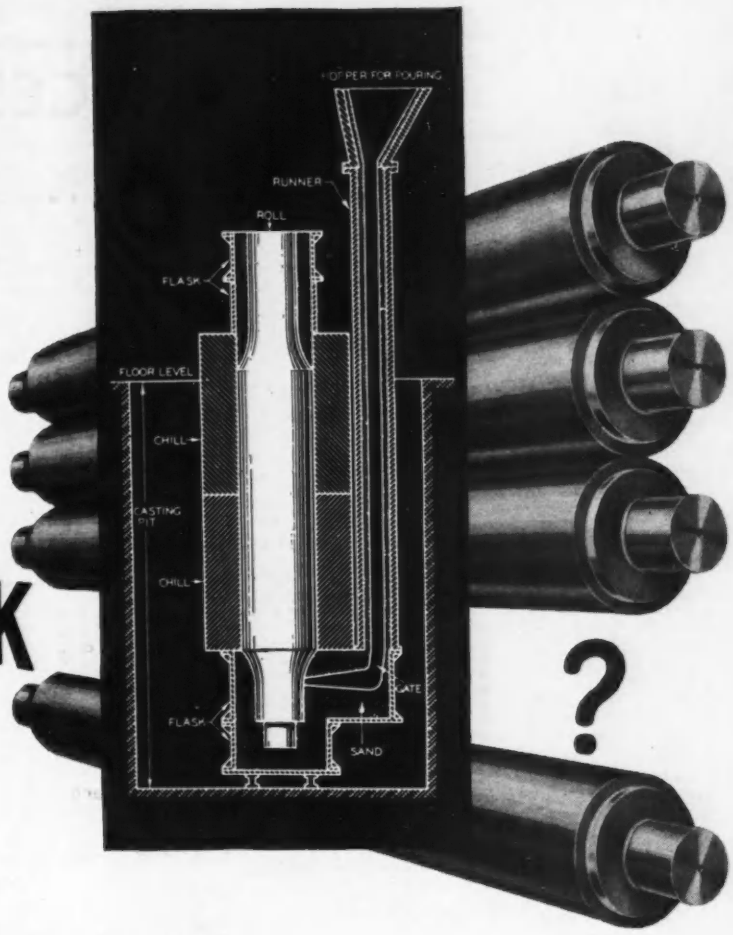
Reinhold Gould Stages Tonnage Contest

NEW YORK—A. Ellis Frampton, assistant general sales manager of Hammermill Paper Company, Erie, Pa., and George Watson, sales representative for Wheelwright Papers, Inc., won prizes offered by Reinhold-Gould, Inc., during the American Pulp and Paper Association Convention at the Waldorf Astoria Hotel.

Visitors to the Reinhold-Gould suite in the Waldorf were eligible to compete for two handsome leather traveling bags. Frampton earned his award the hard way. He outdistanced the field in a guessing game, which challenges the contestants to guess how many pounds of book paper are consumed monthly by a number of popular magazines and trade journals.

Reinhold-Gould will occupy Waldorf headquarters again during the forthcoming Convention of the National Paper Trade Association.

What makes a ROLL READY for life in a CALENDER STACK



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It takes three things to prepare a roll for the wear and pressures of life in a calender stack.

1. Knowledge of correct designs and materials for various requirements.
2. Metallurgical control and skill in casting.
3. Extreme accuracy in machining and grinding

Farrel has developed these abilities during nearly a century of casting, machining and grinding thousands of different types of rolls in *America's largest specialty roll shop at Ansonia.*

WHAT THIS MEANS TO THE ROLL USER

Every Farrel calender roll has a clear, hard chilled surface, with the skin of sufficient depth to provide maximum wear but not so deep as to detract from the strength of the roll. Farrel rolls, from 5" to 72" in diameter and up to 312" face, are given exactly the correct amount and shape of crown. Rolls not requiring crown are made round and straight to tolerances as close as one-quarter of a thousandth of an inch.

For rolls that will serve longer in your calender stack, call on Farrel. Write for complete information on rolls or any of the paper mill equipment listed on this page.

FB-377

FARREL-BIRMINGHAM COMPANY, INC.
ANSONIA, CONN.

Plants: Ansonia, Derby and Stonington, Conn., Buffalo, N. Y.
Sales Offices: Ansonia, Buffalo, New York, Pittsburgh, Akron, Chicago, Los Angeles, Tulsa, Houston, Charlotte

FARREL PAPER MILL MACHINERY

ROLLS: Chilled Iron, Dry Sand, Meehanite, Alloy Iron, Steel, Chromium Plated
FOR: Calender Stacks
Board Calenders
Super Calenders
Glassine Calenders
Friction Rolls
Breaker Rolls
Smoothing Rolls
Coating Rolls
Creping Rolls
Plater Rolls
Cutting Rolls
Paraffining and Waxing Rolls
Saturating Rolls
Silicating Rolls
Miscellaneous Special Purposes
CALENDERS: Paper and Board
GRINDING MACHINES: Roll
CALIPERS: Roll
GEARS, CUT: Spur, Single and Double Helical (Farrel-Sykes Continuous Tooth Type)
SPEED REDUCING GEAR UNITS
SPEED INCREASING GEAR UNITS
FLEXIBLE COUPLINGS

Farrel-Birmingham

PRICES

With the elimination of price controls on paper, pulp, rags and other materials, the quotations given below once more become indicative of trends in an open market. At the moment they can be of little more, for, while some volume of business still is being done under contract at the figures given below, fluctuations representing special conditions are too varied and too frequent to permit prices to be given as representing a wholly stabilized market.

Paper

(Delivered New York)

Standard News, per ton—

Roll, contract	$84.00	@	—
Sheets	103.00	"	—

Kraft—per cwt.—Carload Quantities Zone A. Delivered 40 lb. base weight

Superstandard Wrapping	$6.25	@	$6.50
No. 1 Wrapping	6.00	"	6.25
Standard Wrapping	5.25	"	6.00
Standard Bag	5.25	"	6.00

Tissues—Per Ream 24x36 (480) 10 lb. Zone 1.

Wh. No. 1 Frd.	1.10	@	1.20
Wh. No. 1 M. G.	1.10	@	1.20
Wh. No. 1½	.95	@	1.10
Wh. No. 2	1.00	@	1.10
Wh. Anti-Tar.	2.25	@	3.50
Kraft Unbl.	1.15	@	1.25
Manila No. 2	.90	@	1.05

Toilet—Per Case of 100 rolls 1 M Sheets.

Unbleached	4.47	@	5.50
Bleached	6.50	"	—

Paper Towels — Per Case of 3750 Zone 1.

Wh. C. fold 11x13¼	4.09	@	—
Br. Sgl. fold 10 in.	2.37	"	2.48
Br. M'tif'd 9¼x14¾	3.48	"	—
Br. M'tif'd 9¼x9¾	2.37	"	2.48

Manila—per cwt.—C. l. f. a.

No. 1 Jute	11.25	@	—
No. 1 Manila 35 lb.	6.00	"	7.00

Boards, per ton—

News	*70.00	@	75.00
Chip	*67.50	"	73.00
Sgl. Mla. Lt. Chip	*80.00	"	89.00
White Pat. Coated	*86.00	"	101.50
Kraft Liners 42 lb.	*84.00	"	100.00
Binders Boards	94.00	"	126.00

Base Prices per 10 tons. Less than 10 tons but over 3 tons, add $2.50; three tons or less, add $5; regular 35-39 basis, add $5; basis 40-49, add $2.50; basis 91-100, add $2.50; basis 101-120, add $5.

The following are representative of distributors' resale prices, all deliveries in Zone 1:

Rag Content Bonds and Ledgers—White, Assorted Items

	Bonds		Ledgers	
100% Rag Ext. No. 1	$39.75	@ $46.75	$40.90	@ $48.00
100% Rag	32.85	" 38.50	34.00	" 40.00
85% Rag	....	"	30.55	" 38.75
75% Rag	24.30	" 28.50	24.45	" 30.00
65% Rag	....	"	....	" ....
50% Rag	20.05	" 24.50	21.25	" 25.75
25% Rag	17.85	" 21.75	19.00	" 23.25

Colors at $1.00 cwt. extra.

Sulphite Bonds and Ledgers.. White, Assorted Items

	Bonds		Ledgers	
No. 1	$12.00	@ $14.50	$13.15	@ $16.00
No. 2	11.25	" 13.75	12.25	" 15.00
No. 3	....	"	....	" ....
No. 4	10.60	" 13.00	11.75	" 14.25

Colors $1.00 cwt. extra.

Free Sheet Book Papers—White, Cased Paper

No. 1 Glossy Coated	$14.70	@	$16.75
No. 2 Glossy Coated	13.75	"	15.50
No. 3 Glossy Coated	13.20	"	16.00
No. 4 Glossy Coated	12.80	"	14.90
No. 1 Antique (Watermarked)	11.35	"	12.75
No. 2 Offset	10.65	"	12.25
A Grade E. F.	10.60	"	12.00
A Grade S. & S. C.	11.00	"	12.50
B Grade E. F.	10.30	"	11.75
B Grade S. C.	10.70	"	12.25
C Grade E. F.	10.00	"	11.50
C Grade S. C.	10.40	"	12.00
D Grade E. F.	9.70	"	11.00
D Grade S. & S. C.	10.10	"	11.50

Ivory & India at $.50 cwt. extra.

Wood Pulp

Domestic mill prices delivered with former OPA freight allowances.

	Per Short ADT		
Groundwood	$75.00	to	—
Unbleached Sulphite	105.00	"	—
Bleached Sulphite	115.00	"	122.50
Bleached Soda	105.00	"	115.00
Unbleached Kraft	102.50	"	—
Southern Kraft	90.00	"	102.50

Canadian mill prices delivered with freight allowances of $7.50 per ADT; unless otherwise specified:

	Per Short ADT		
Regular Kraft	$102.50	to	—
Select Unbleached Kraft (no freight allowance)	105.00	"	—
Unbleached Sulphite	105.00	"	—
Glassine Unbleached Sulphite (no freight allowance)	102.50	"	—
Bleached Soda	105.00	"	115.00
Groundwood	75.00	"	80.00
Siderums Pulping News	75.00	"	—
Hardwood and Specialty Grades	Nominal		

Swedish wood pulp prices, per ton of 2,000 lbs. air dry weight on dock usual Atlantic and Gulf ports with an average freight cost of about $9.00 per short ton included. Subject to change as it is said these prices are not satisfactory to Swedish producers:

	Per Short ADT
Bleached Sulphite	$120.00
Bleached Kraft	126.00
Unbleached Sulphite	95.00
Unbleached Kraft	89.00

Finnish quotations ex. dock, New York

	Per Short ADT
Bleached Sulphite	$165.00
Unbleached Sulphite	132.50
Unbleached Sulphite (special grade)	137.50
Unbleached Sulphate	132.50
Unbleached Sulphate (special grade)	159.00

Other European countries, at the present time, are not quoting on prompt and forward deliveries of wood pulp, because they have no tonnage available for export.

New Domestic Cotton Cuttings

(Prices delivered Mill Plus Dealer's Commission)

White Shirt	$11.50	to	$12.00
Light Silesias	7.50		
Unbleached Muslin	11.50	"	12.00
White Back Blue Overalls	8.25		
Blue Overalls	7.75		
Unbl. Fancy Shirt	4.50	"	5.00
Light Percales	5.50	"	6.00
Light Prints	5.25	"	5.95
Washables	4.00		
Bleachable Khaki	5.50	"	6.00
Unbleachable Khaki	5.00	"	5.50
Cottonades	4.50	"	5.00

Old Domestic Cotton Rags

(F.O.B. Shipping Point Plus Dealer's Commission)

	Per 100 lbs		
No. 1 Whites Repacked	$5.00		
No. 1 Whites Miscellaneous	4.25		
No. 2 Whites Repacked	4.00		
No. 2 Whites Miscellaneous	3.50		
Blue Overalls	3.75		
Thirds and Blues Repacked	3.00		
Thirds and Blues Miscellaneous	2.50		
No. 1 Roofing Rags	2.20		
No. 2 Roofing Rags	2.10		
No. 3 Jute Bagging	2.00		
No. 4 Brussels and hard back carpets	2.00		
No. 5A Roofing Rags	2.00		

New Foreign Cotton Cuttings

(Prices delivered Mill)

	Per 100 lbs.		
New Dark Cuttings	$6.00	to	....
New Mixed Cuttings	6.50	"	....
Light Silesias	9.00	"	10.00
Light Flannelettes	8.00	"	9.00
New White Cuttings	13.00	"	15.00
Fancy Shirt Cuttings	9.00	"	10.00
Light Prints	8.00	"	10.00
Bleachable Khaki, No. 1	7.00	"	7.50
Unbl. Khaki, No. 1	6.25	"	6.75

Old Foreign Rags

(F.O.B. New York)

	Per 100 lbs.		
No. 1 White Linens	$14.00	to	16.00
No. 2 White Linens	12.00	"	13.00
No. 3 White Linens	8.00	"	9.00
No. 4 White Linens	8.00	"	9.00
No. 1 White Cottons	10.00	"	12.00
No. 2 White Cottons	8.00	"	9.00
No. 3 White Cottons	6.50	"	7.00
No. 4 White Cottons	5.00	"	5.50
Extra Light Prints	7.50	"	8.00
No. 1 New Light Prints	6.25	"	6.75
Med. Light Prints	5.25	"	5.75
Dutch Blue Cottons	5.25	"	5.50
Checks and Blues	4.00	"	4.25
Linsey Garments	4.50	"	5.00
Dark Cottons	3.75	"	4.00
Old Shopperies	3.25	"	3.50
New Shopperies	3.25	"	3.50

BAGGING

(Prices to Mill, f.o.b. N. Y.)

	Per 100 lbs.		
Foreign Gunny, No. 1	$4.75	to	5.00
Domestic Gunny, No. 1	4.25	"	4.50
Light Wool Tares	4.50	"	4.75
Heavy Wool Tares	4.75	"	5.00
Bright Bagging	4.25	"	4.50
Foreign Manila Rope	6.00	"	7.00
Domestic Manila Rope	5.75	"	....
Jute Strings	4.50	"	5.00
No. 1 Sisal Strings	4.00	"	4.50
Mixed Strings	1.75	"	....

Waste Paper

Prices to Mills

(Dollars Per Ton)

F.o.b. New York, Baled

No. 1 Hard White Envelope Cuts, one cut	$100.00	@	$120.00
No. 1 Hard White Envelope Cuts	90.00	"	100.00
No. 1 Hard White Shavings, unruled	100.00	"	110.00
No. 1 Hard White Shavings, ruled	80.00	"	90.00
Soft White Shavings, one cut	95.00	"	105.00
No. 1 Soft White Shavings	85.00	"	95.00
Soft White Shavings, Misc.	65.00	"	75.00
No. 1 Fly Leaf Shavings	55.00	"	60.00
No. 2 Fly Leaf Shavings	50.00	"	55.00
No. 1 Groundwood Fly Leaf Shavings	30.00	"	33.00
No. 2 Mixed Groundwood Fly Leaf Shavings	(nominal)		
Mixed Colored Shavings	(nominal)		
Mixed Groundwood Colored Shavings	(nominal)		
Overissue Magazines	(nominal)		
No. 1 Heavy Books & Magazines	40.00	"	45.00
Mixed Books	22.00	"	25.00
No. 1 White Ledger	70.00	"	80.00
No. 2 Mixed Ledger, colored	60.00	"	70.00
New Manila Envelope Cuttings, one cut	100.00	"	110.00
New Manila Envelope Cuttings	65.00	"	75.00
Extra Manilas	40.00	"	45.00
Mixed Kraft, Env. & Bag Cuttings	75.00	"	85.00
Kraft Envelope Cuttings	100.00	"	105.00
Triple Sorted, No. 1 Brown Soft Kraft	70.00	"	75.00
New 100% Kraft Corrugated Cuttings	70.00	"	75.00
No. 1 Assorted Old Kraft	40.00	"	50.00
New Jute Corrugated Cuttings	27.00	"	—
Old 100% Kraft Corrugated Containers	(nominal)		
No. 1 News	26.00	"	27.00
No 1 Mixed Paper	19.00	"	21.00
Box Board Cuttings	23.00	"	
White Blank News	75.00	"	80.00
Overissue News	(nominal)		
Old Corrugated	28.00	"	30.00
Mill Wrappers	22.00	"	25.00

Twines

All Prices Nominal (F. o. b. Mill) (Soft Fiber)

Coarse Polished—India	.26	@	.29
Fine Polished—Fine India	.31	"	.35
Unpolished—			
Paper Makers	.20	"	.26
Tube Rope	.22	"	.27½
Wrapping	.26	"	.33¼
Cotton	.70	"	—
(Hard Fiber)			
Mex. Sisal	.21	"	.24
Manila	.33	"	—
(Hemp)			
Polished Hemp	.63	"	—

PHILADELPHIA

Domestic Rags (New)

(F.O.B. Eastern Shipping Point)

Shirt Cuttings—			
New White No. 1	.07¼		
New White No. 2	.05¾		
Light Silesias	.05¾		
Black Silesias, soft	.03¾		
New Unbleached	.07½		
Washable Prints	.04¼		
Washable No. 1	.03		
Blue Overall	.05½		
Cottons—Acording to grades—			
Washable Shredding	.01¾		
Fancy Percales	.04¾		
New Black Soft	.03¼		
Khaki Cuttings—			
Unbleachable Cotton Cuttings	.03½		
Bleachable Cotton Cuttings	.04¼		
Men's Corduroy	.03½		
Ladies' Corduroy	.03		
Cottonades	.03¼		

Domestic Rags (Old)

White No. 1—Repacked	3.80	to	4.00
Mixed White	3.50	"	—
White No. 2—Repacked	2.90	"	—
Thirds and Blues—			
Miscellaneous	1.80	"	2.50
Repacked	2.20	"	—
Roofing Stock—			
Foreign No. 1	1.85	"	—
Domestic No. 1	1.75	"	—
Domestic No. 2	1.65	"	—
Roofing Bagging	1.35	"	—
Old Manila Rope	5.75	"	—

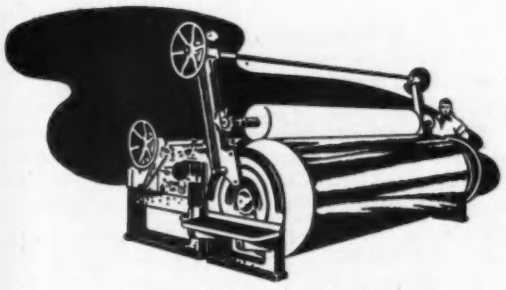
Bagging

(F.O.B. Eastern Shipping Point)

Gunny No. 1—			
Foreign	Nominal		
Domestic	3.00	to	3.50
No. 1 Clean Bright—Sisal Strings	.04	"	—
No. 2 Clean Bright—Sisal Strings	.03	"	—
Sisal Jute	.02½	"	.02¾
Scrap—			
No. 1	3.25	"	3.50
No. 2	1.75	"	1.85
Wool Tares, heavy	4.00	"	4.25

PRECISION

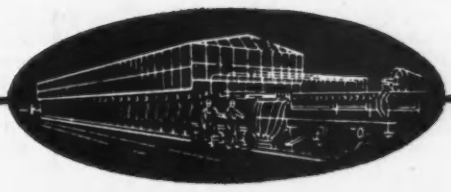
EXPERIENCED HANDS



The caliper in this workman's hand definitely illustrates the reason for the efficient functioning of Bagley & Sewall Paper Machines. "Precision" is a word that has real meaning in the Bagley & Sewall Shops. A decided emphasis on detail prevails. Possibly just a little more care is taken in the manufacture than may seem absolutely necessary, but the efficient production of paper on these paper machines proves the value of this exactness.

When considering new papermaking equipment, get in touch with our engineers.

BAGLEY & SEWALL



WATERTOWN, NEW YORK

No. 1 New Light Burlap	3.00	"	4.00
New Burlap Cuttings	3.75	"	4.00

Old Papers

(F. o. b Phila.)
Mill Prices, Baled

No. 1 Hard White Envelope Cuts, one cut	$100.00	@	$115.00
No. 1 Hard White Shavings, unruled.	100.00	"	—
Soft White Shavings, one cut	90.00	"	95.00
White Blank News	45.00	"	50.00
Soft White Shavings, Misc.	65.00	"	70.00
No. 1 White Ledger	52.00	"	55.00
No. 2 Ledger, colored	42.00	"	45.00
No. 1 Heavy Books & Magazines	38.50	"	40.00
Overissue Magazines	nominal		
New Manila Envelope Cuttings	65.00	"	75.00
No. 1 Assorted Old Kraft	40.00	"	—
No. 1 Mixed Paper	19.00	"	21.00
Box Board Cuttings	23.00	"	25.00
Kraft Corrugated Cuttings	nominal		
Old Corrugated	28.00	"	30.00
Overissue News	35.00	"	—
No. 1 News	26.00	"	30.00

BOSTON

Old Papers

(F. o. b. Boston)
Mill Prices, Baled

No. 1 Hard White Shavings, unruled	7.00	@	8.00
No. 1 Hard White Shavings, ruled	7.00	"	8.00
Soft White Shavings, Mis.	6.25	"	6.50
No. 1 Fly Leaf Shavings	1.65	"	1.80
No. 2 Fly Leaf Shavings	2.00	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Groundwood Fly Leaf Shavings	1.25	"	1.50
Mixed Colored Shavings	2.50	"	2.75
New Manila Envelope Cuts, one cut	5.00	"	5.50
Hard White Envelope Cuts, one cut	3.37½	"	—
Triple Sorted No. 1 Brown Soft Kraft	3.50	"	3.75
Mixed Kraft Env. & Bag Cuttings	3.75	"	4.00
Kraft Envelope Cuttings	3.75	"	4.00
No. 1 Heavy Books & Magazines	2.50	"	2.60
New Manila Envelope Cuts, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
White and Colored Tabulating Cards	4.25	"	4.50
Groundwood Tabulating Cards	1.35	"	—
White Blank News	1.65	"	—
No. 1 Assorted Old Kraft	3.50	"	—
No. 1 Mixed Paper	—	"	.95
Overissue News	1.50	"	1.75
Box Board Cuttings	.72½	"	—
New Corrugated Cuttings, Kraft	2.25	"	—
Old 100% Kraft Corrugated Containers	1.75	"	—
Old Corrugated Containers	1.50	"	—
Jute Corrugated Cuttings	1.07½	"	—
Paper Strings	2.25	"	2.50

Bagging

(F. o. b. Boston)

Gunny Bagging—			
Foreign	5.00	@	—
Domestic	5.00	"	5.12½
Sisal Rope No. 1	6.00	"	—
Sisal Rope No. 2	5.50	"	—
Mixed Rope	5.25	"	—
Mixed Strings	2.00	"	2.50
Transmission Rope—			
Foreign	(nominal)		
Domestic	3.00	"	3.50
Manila Rope—			
Foreign	(nominal)		
Domestic	6.25	"	—
Soft Jute Rope	5.00	"	5.25
Jute Carpet Threads	6.00	"	—
Bleachery Burlap	8.50	"	9.00
Scrap Burlap—			
Foreign	4.75	"	5.00
Domestic	5.00	"	5.25
South America	5.25	"	—
Wool Tares—			
Foreign	4.50	"	—
Domestic	4.50	"	—
Aust. Wool Pouches	5.00	"	5.25
New Zealand Wool Pouches	5.25	"	5.50
New Burlap Cuttings	6.00	"	6.50
Heavy Baling Bagging	5.25	"	5.75
Paper Mill Bagging	3.50	"	3.75
No. 1 Roofing Bagging	1.75	"	—

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints	.07	@	.07½
Fancy Percales	.07½	"	.08
New White No. 1	.10	"	.11
New Light Flannelettes	.08	"	.08½
Canton Flannels, Bleached	.10	"	.11
Underwear Cutters, Bleached	.10	"	.11
Underwear Cutters Unbleached	11	"	.12
Silesias No. 1	.07	"	.08
New Black Silesias	.05	"	—
Red Cotton Cuttings	.05	"	—
Soft Unbleached	.11	"	.12
Blue Cheviots	.07½	"	.08
Fancy	.06	"	—
Washable	.06	"	—
Khaki Cuttings	.06	"	.07
O. D. Khaki	.07	"	—
Corduroy	.03½	"	—
New Canvas	06½	"	06¾
B. V. D. Cuttings	.10	"	.11

Domestic Rags (Old)

(F. o. b. Boston)

White No. 1—			
Repacked	3.80	@	—
Miscellaneous	3.20	"	—
White No. 2—			
Miscellaneous	2.65	"	—
Twos and Blues, Repacked	2.20	"	—
Old Blue Overalls	2.25	"	2.50
Thirds and Blues, Repacked	2.20	"	—
Miscellaneous	1.80	"	—
Black Stockings	3.50	"	4.00
Roofing Stock—			
No. 1	2.00	"	—
No. 2	1.90	"	2.00
No. 3	1.35	"	—
No. 4	1.35	"	—
No. 5, Quality A.	1.35	"	—
Quality B.	1.20	"	—
Quality C.	.95	"	—
Old Manila Rope	6.00	"	—

Foreign Rags

(F. o. b. Boston)

Canvas	(nominal)
Dark Cottons	(nominal)
Dutch Blues	(nominal)
New Checks and Blues	(nominal)
Old Fustians	(nominal)
Old Linsey Garments	(nominal)
New Silesias	(nominal)

CHICAGO

Waste Paper

(F. o. b. Chicago)
Mill Prices, Baled

Shavings—			
No. 1 Hard White Envelope Cuts, one cut	$110.00	@	$120.00
No. 1 Hard White Shavings, unruled	105.00	"	115.00
No. 1 Soft White Shavings	80.00	"	95.00
No. 1 White Ledger	55.00	"	65.00
No. 1 Heavy Books & Magazines	40.00	"	43.00
White Blank News	43.00	"	49.00
Mixed Kraft Env. & Bag Cuttings	75.00	"	85.00
No. 1 Assorted Old Kraft	45.00	"	55.00
Overissue News	38.00	"	42.00
No. 1 News	30.00	"	—
No. 1 Mixed Paper	19.00	"	20.00
Old Corrugated	33.00	"	—
Mill Wrappers	25.00	"	29.00

MARKETS

BLANC FIXE — Demand active, supply steady, deliveries slow. Pulp is currently quoted at $55 per ton, in barrels, car lots, at works; the powder is quoted at $67.50 per ton car lots, f.o.b. works.

BLEACHING POWDER — Supplies adequate to meet current demands although there is some delay in current shipments. Quotations are unchanged. Prices on bleaching powder range from $2.65 to $3.35 per 100 pounds, in drums, car lots, at works.

CASEIN—Current prices on processed acid precipitated casein are reported around 37 to 43 cents per pound for both domestic and Argentine grades, f.o.b. shipping point, with quantity not specified at present.

CAUSTIC SODA — Shipments are behind schedule. Cut-back production further reduces stocks. Solid caustic soda is reported at $2.50 per 100 pounds; flaked and ground offered at $2.90 to $3 per 100 pounds.

CHINA CLAY—Supply tight as demand continues heavy. Domestic filler clay is currently $8.50 to $9 per ton, car lots. Coating clay is $12 car lot and $16 less car lot. Imported clay is $20 to $22 per ton, car lot, export warehouse; and $45 less car lot for powdered.

CHLORINE — Market tight as demand continues to exceed output, stocks low. Lack of tank cars continues to hamper deliveries. Quotations unchanged. Chlorine is currently quoted at $2 to $2.25 per 100 pounds.

ROSIN—Gum rosin in drums, per 100 pounds net, in yard New York, car lots, B, D, $10.80; E, F. G, H, I, K, M, $11.50; WG, $11.75; WW, $11.75; Wood Rosin, per 100 pounds l.c.l., f.o.b. N. Y., B, $7.45; FF, $8,95; G, H, I, $10.25; WW and X, $10.45.

SALT CAKE — Demand continues to increase with supplies showing little improvement. Prices remain unchanged. Domestic salt cake is quoted at $22 to $24 per ton in bulk. Chrome salt cake is quoted at $16 per ton.

SODA ASH — Demand active as supplies continue short, previous orders filled. Contract orders prevail at the same high levels. Current prices, car lots, per 100 pounds, are as follows: in bulk, $1.05; in paper bags, $1.20; and in barrels, $1.60.

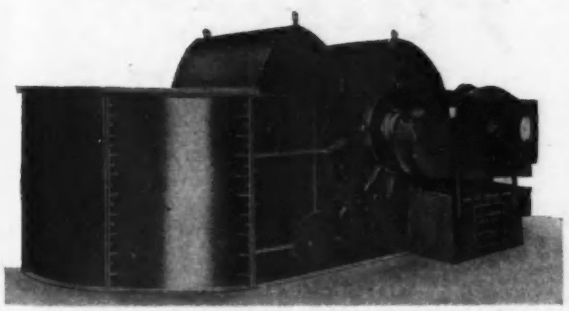
STARCH — Supplies are showing steady improvement. Previous orders filled. Starch prices continue strong with the pearl grade quoted at $4.02 per 100 pounds; powdered starch at $4.13 per 100 pounds.

SULPHATE OF ALUMINA—Demand active, supply fair. Quotations continue unchanged. The commercial grades are quoted at from $1.15 to $1.20 per 100 pounds, in bags, car lots, f.o.b. works. The iron free is quoted at $1.75 to $2 per 100 pounds, in bags, at works.

SULPHUR — Strong seasonal demand is reported with stocks plentiful to meet all requirements. Annual contracts are quoted at $16 per long ton, f.o.b. mines; the price f.o.b. at Gulf Ports is $17.50 per long ton.

TALC—Domestic and French grades are moving in fair volume with prices steady. Domestic grades are currently quoted at from $16 to $30 per ton at mines; Canadian at $35 to $45 per ton. All prices in car lots.

THE STANDARD BEATER OF THE PAPER INDUSTRY



UNIFORM FIBRE TREATMENT

SHORT BEATING CYCLE

AUTOMATIC CONTROL

LOW H.P. PER TON

The satisfactory results of the Jones-Bertrams Beater have been evidenced in mill after mill:

UNIFORM FIBRE TREATMENT—Practically 100 per cent circulation is accomplished, thereby producing uniformly refined fibres.

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LOW H. P. PER TON—Highly efficient utilization of horsepower.

FLOOR SPACE SAVING—Replaces three, four, or more regular Hollanders.

In the event that you have not already investigated all the advantages of the Jones-Bertrams Beater, we will be pleased to give full particulars.

Jones

E. D. JONES & SONS COMPANY, Pittsfield, Mass.
Builders of Quality Machinery for Paper Mills.

IN PART

Any number of cases in which small newspapers were reported to be in danger of suspension because of lack of newsprint have involved newspapers which are supplied regularly by jobbers or merchants and who do not buy directly from the mills.

The first step in each case has been to learn the name of the jobber or the merchant and the name of the newsprint manufacturer supplying that jobber or merchant. Most often it has been found that the fear of suspension was not justified. The jobber or the merchant has been able to give assurances that the newspaper would be supplied with enough newsprint to continue publication. Shipments have been delayed and inventories are extremely low for many small papers, but jobbers, merchants and manufacturers have in the great majority of instances given every indication that they are doing their best to prevent any newspaper from suspending.

In a few cases in which mills have refused to renew contracts with certain jobbers who were supplying newspapers, it has been necessary for The Inland officers or the officers of the other cooperating associations to urge upon the mills their moral responsibility to arrange for the supply of these bona fide newspapers. In no case to date when the appeal was legitimate has the newsprint manufacturer refused to recognize and assume his responsibility.—*John W. Potter, Editor and Co-Publisher, Rock Island Argus; Chairman, Newsprint Committee, Inland Press Association.*

Production Ratio Report*

(Production as per cent of six-day capacity)

COMPARATIVE WEEKLY SUMMARIES

Current Weeks—1947		Corresponding Weeks—1946	
February 1	104.0	February 2	101.5
February 8	106.2	February 9	99.7
February 15	104.5	February 16	95.0
February 22	105.9	February 23	98.0
March 1	108.5	March 2	101.8
March 8	*104.5*	March 9	103.4

COMPARATIVE MONTHLY SUMMARIES

1946						1947	
Jan.	94.7	May	100.7	Oct.	106.4		
Feb.	98.4	June	104.6	Nov.	105.5	Jan.	102.1
Mar.	104.4	July	94.0	Dec.	97.0	Feb.	*105.9*
April	102.7	Aug.	104.7	Year Avg.	101.1		
		Sept.	101.3				

COMPARATIVE YEARLY SUMMARIES

	1940	1941	1942	1943	1944	1945	1946	1947
Year to Date	86.6	88.1	103.8	88.4	88.4	87.7	96.9	*104.7*
Year Average	85.6	97.4	90.4	87.8	88.1	89.7	101.1	

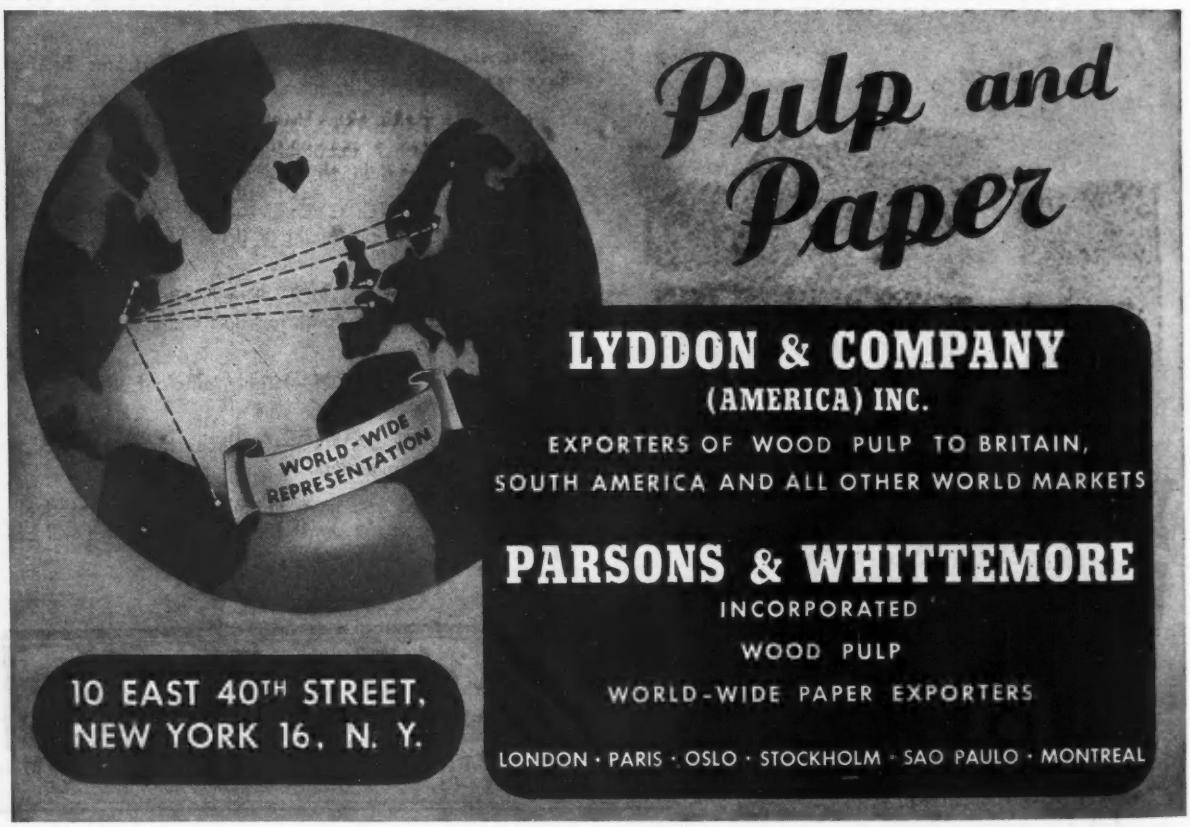
PAPERBOARD OPERATING RATIOS†

Current Weeks—1947		Corresponding Weeks—1946	
February 1	102	February 2	95
February 8	104	February 9	97
February 15	102	February 16	94
February 22	103	February 23	97
March 1	102	March 2	98
March 8	*102*	March 9	99

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Year Avg.
1946	90	97	100	99	94	97	89	99	96	100	99	92	96
1947	99	*103*											

* Based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

† Percents of operation based on "Inch-Hours" reported to the National Paperboard Association.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EDITORIAL

Economic Development

Probably not a soul of the large crowd that heard him speak at the annual lunch of the American Paper and Pulp Association failed to attach some particularly specific meaning to the words of Dr. Theodore O. Yntema. The paper and pulp industry indeed, has a vast stake in the problem of maintaining a satisfactory level of production—of avoiding or reducing the effects of booms or busts.

Like steel, the speaker reminded his hearers, the pulp and paper industry has been a "prince and pauper" industry. The total demand for its products fluctuates less than for steel—almost exactly in proportion to the total production of goods and services in this country. But profits can skyrocket or nose-dive as demand presses on capacity, or falls much below capacity. Today, with extradordinary profits the paper industry in beneficiary of a postwar boom based on an inflated money supply. If the next depression is severe, much of the industry will be in the red. And whether or not future depressions are severe will depend on what is done about government expenditures, taxes, the management of the federal debt, the control of credit, labor legislation and other policies of government, as well as on what is done by business men about prices, inventories and capital investment.

Today there is great need and great opportunity for business statesmanship. If businessmen will take as their motto, "What is good for the country is good for business," and if they will make the arduous efforts to find out what the score really is, they can have an important part in shaping the public policies that will determine the future of capitalism and democracy, the speaker told his audience.

"During the decade of the 'thirties" he said, "we lost some two hundred billions of dollars of goods and services because men and machines were idle. Most of that loss could have been avoided—much of it by simple measures. During the last few years we spent $2 billions to discover the secrets of atomic energy. One per cent of that amount, or $2 million a year for ten or fifteen years, devoted to the problems of stable prosperity in a progressive free enterprise economy could easily yield dividends of a hundred per cent or a thousand per cent, and perhaps of one hundred thousand percent or even one million per cent. Such dividends could be attained if enough men of stature in business would go to work with men of stature in the professions of economies and political science, and if they would jointly focus their minds on the key problems of economic policy."

There are two main problems to be faced he pointed out. First, the maintenance of the dynamic, progressive charter of the economy which has raised productivity so dramatically decade after decade for the past hundred years and more. Second, the achievement of greater stability in production and employment—the reduction in the boom-bust characteristics of the economy.

The maintenance of progress in the economy depends principally on the maintenance of competitive rewards and penalties. With active competition and adquate rewards and penalties, there will be plenty of invention, plenty of innovation, and plenty of effort directed toward increased efficiency. While a dearth of scientific discovery or a dearth of savings could impede progress we are not likely to suffer these dearths. We may perhaps continue to dilute the rewards of successful competition so much by taxation as to make risk-taking unattractive. But by far the greatest hazard to continued economic progress lies in the encroachment of monopolistic restrictions sought by labor groups, by farm groups and by business groups for their special advantages. Fear of depression loads to demands for featherbedding, the annual wage, parity prices, production restrictions, tariffs, and other devices to escape the rigors of competition.

Easy Complaints

Without discounting the costly effects of hostile headlines, when those headlines reflect the snap judgments of Congressional investigators who seek prominence for themselves in the size of the objects that they attack, the newsprint industry can count itself fortunate in the friends that it has made in the years that it has been dealing with its customers. Witness the considered opinion about complaints of shortage as expressed by the publisher of a small city midwestern newspaper. Says E. P. Adler of the Davenport Times;

"I think the members ought to understand that a good many of these complaints coming in are not justified. Some publishers have anticipated being in trouble six or seven months from now and they want to get taken care of now while most of us are working on a 30-day basis.

"It has been quite a job to take care of these people; and when you investigate, you find out the facts are different and that they are not nearly as bad as has been made out in their first letter.

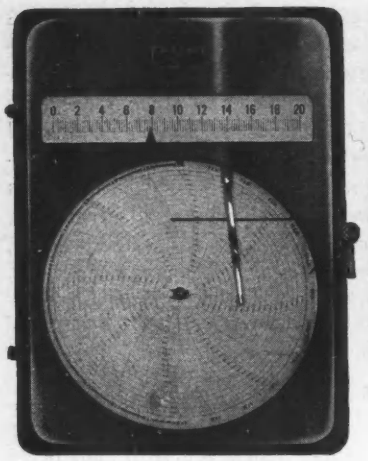
"I think with the situation as it is in the print paper market, that is, with South America and Australia and a few other countries offering from $150 to $300 a ton, that we are very fortunate in having mills in Canada that are taking care of their regular customers and withstanding that temptation."

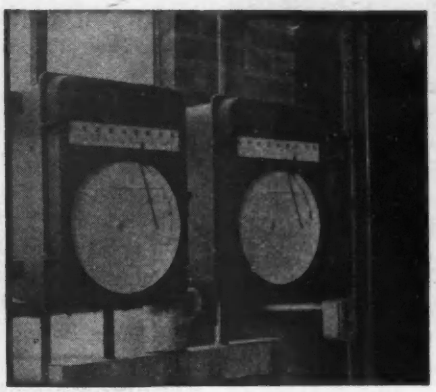
W. L. Cook

EDITOR

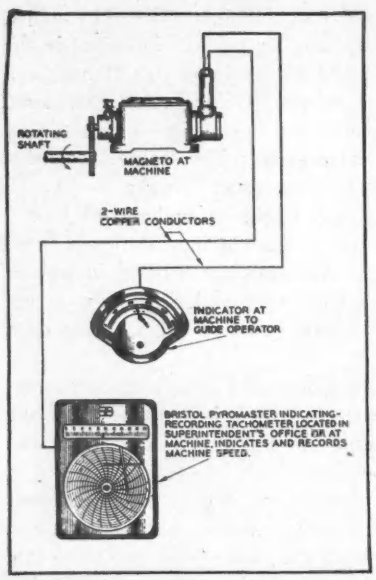
How Bristol's Pyromaster Tachometers Report Changes in Paper Travel Speed

Instantly and Accurately...Electrically





Two Bristol Pyrometer Tachometers keeping tabs on machine speeds in a Massachusetts mill. Notice how the magneto is silent chain-connected to one of the rolls.


ROTATING SHAFT
MAGNETO AT MACHINE
2-WIRE COPPER CONDUCTORS
INDICATOR AT MACHINE TO GUIDE OPERATOR
BRISTOL PYROMASTER INDICATING-RECORDING TACHOMETER LOCATED IN SUPERINTENDENT'S OFFICE OR AT MACHINE. INDICATES AND RECORDS MACHINE SPEED.

Some paper mills install an indicating tachometer at the machine to guide operator and a recorder in superintendent's office for permanent records. Other mills rely on one Indicating-Recording Pyromaster Tachometer mounted close to the machine.

Bristol's Indicating-Recording Pyromaster Tachometer responds instantly to changes in machine speed as reported by the heavy-duty Model 44 Magneto which generates voltage directly proportional to the speed. The sensitive recording mechanism—unaffected by vibration—moves only when the galvanometer responds to a speed change. That reduces wear of moving parts to the minimum.

With no mechanical connection between galvanometer and the other units, the galvanometer, potentiometer unit and potentiometer relays are housed in separate gasketed cases for protection against dust and air currents when the instrument door is open.

All parts are accessible with the instrument in full operation. Dial and recording mechanism are mounted on the front of a hinged panel, with slide wire and potentiometer mechanism on the back. Each part can be serviced without disturbing any other part. No lubrication is ever required.

Other features of Bristol's Pyromaster Tachometer are fully described in Bulletin S1400. Address THE BRISTOL COMPANY, 148 Bristol Road, Waterbury 91, Conn. (The Bristol Co. of Canada, Ltd., Toronto, Ont. Bristol's Instrument Co., Ltd., London, N.W. 10, England). West Coast: *Branch Factory*—40 Berry St., San Francisco 7, Calif. *Branch Office* — White Building, Seattle 1, Washington. Lake Region: *Branch Factory & Office*—351 East Ohio St., Chicago 11, Ill. Southern States: *Branch Office*—Comer Building, Birmingham 3, Alabama.

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SECTION OF THE

TECHNICAL ASSOCIATION
OF THE PULP AND PAPER INDUSTRY

122 E. 42nd ST., NEW YORK 17, N. Y. *Edited By* R. G. MACDONALD, *Secretary*

Comparative Studies in the Chlorination of Woodpulp*

By Oliver S. Sprout, Jr.[1] and Thomas W. Toovey[2]

(Continued from March 13, 1947)

Threshold Chlorination with Recycled Liquors: Three-Stage Chlorination

Sulphate pulp bleaching by the process consisting of chlorination-alkali-chlorination-hypochlorite-hypochlorite-SO_2 stages still afforded unexplored opportunities for recycling chlorine-containing liquors by the summary termination of the second chlorination stage to avoid prolonged reaction times, attendant oxidative reactions, and loss of unconsumed chemical. The unexhausted chlorine from the second stage might be returned to pretreat the pulp prior to the main chlorination stage, resulting in a three-stage chlorination method.

One per cent chlorine was added in the first chlorination stage of a process including subsequent second chlorination stage, alkaline extraction, third chlorination, and alkaline extraction stages. The second chlorination and the first alkali stages followed the usual routine. The third chlorination, however, was allowed to continue for only 5 minutes with varied quantities of chlorine introduced to determine the inputrequired to permit recovery of 1.0% chlorine. The second alkaline stage was added to investigate the necessity for this stage. The resultant data, shown in Table XIII, indicated that the addition of 1.74% chlorine in the third chlorination stage was sufficient to yield after 5 minutes ca. 1.0% chlorine which could be returned to the first chlorination stage. Employment of a second caustic stage after the third-chlorination stage did not appear to offer additional purification of the pulp commensurate with the expenditure of time and processing charges incurred.

The findings of the preliminary tests were applied in a series of full bleaches typified by three chlorination stages in which 1.0% chlorine was added in the first stage, the bulk of the chlorine (3.48% chlorine) was utilized in a normal manner in the second stage, and 1.74% chlorine was introduced in the third chlorination stage, which was interrupted after 5 minutes at the point of substantially complete chlorination with about 1.0% chlorine residual. Normal procedure consisted of successive chlorination-chlorination-alkaline extraction - chlorination - hypochlorite - hypochlorite - acidification stages. In the first run (pulp No. 370A) fresh chlorine was added in the first chlorination stage since no liquors were available for recycling from the third chlorination stage. Liquors containing ca. 1.0% chlorine were withdrawn from the third-chlorination stage of this bleach in the prescribed manner and used to treat another sample of raw pulp in its first-chlorination stage (pulp No. 380A). In addition, a further batch (pulp No. 370B) was prepared with fresh chlorine in the first-chlorination stage, but with a second alkali stage after the third-chlorination stage. Data for these bleaches are found in Table XIV. Pulps with fresh chlorine or recycled chlorine liquor in the first-chlorination stage appeared to be essentially similar, so that no deleterious action resulted from recycling the chlorine containing liquors. However, the addition of a second alkali stage appeared to furnish some benefits, notably regarding final brightness, in contradiction to all previous indications.

Physical Characteristics of the Bleached Pulps

STRENGTH PROPERTIES

The beating characteristics and strength properties of sulphate pulps representing the various types of bleaching procedures were determined for the complete evaluation of the effects of bleaching. The bleaching methods represented were characterized by the following primary stages:

1. Chlorination-alkali extraction, pulp No. 360A.
2. Chlorination-alkali extraction-chlorination, pulp No. 350A.
3. Chlorination - chlorination - alkali extraction - chlorination. Recycled liquors in first chlorination, pulp No. 380A.
4. Same as 3 but with fresh chlorine in first chlorination, pulp No. 370A.
5. Same as 4 but with additional alkaline extraction after third chlorination, pulp No. 370B.

In all cases the primary stages outlined were followed by two stages of hypochlorite bleaching and a final acidification with SO_2.

A specific property of a given pulp has been com-

* Presented at the Annual Meeting of the Technical Association of the Pulp & Paper Industry, Hotel Commodore, New York, N. Y., Feb. 24-27, 1947.

[1] Whitemarsh Research Laboratories, Pennsylvania Salt Mfg. Co., Philadelphia, Pa.

[2] Member TAPPI; Pulp and Paper Technologist, Pennsylvania Salt Mfg. Co., Philadelphia, Pa.

pared with the similar property of the other pulps in relation to beating time in the accompanying diagrams, i.e., beating time in relation to freeness, Fig. 9, burst factor, Fig. 10, tear factor, Fig. 11, and folding endurance, Fig. 12.

The characteristics of the unbleached pulp (pulp No. 330A) have been included for comparison. Curves for pulps Nos. 370A and 370B, which were produced by methods essentially similar to that for pulp No. 380A, have been omitted for the sake of clarity in the drawings, but fell within the ranges represented on the diagrams.

Freeness.

Comparison of the freeness of the pulps under beating showed the pulp from the three-stage chlorination process to be a little more resistant to beating than the pulps from the two-stage chlorination, which was in turn more resistant to beating than the pulp from the single-stage chlorination. The unbleached pulp was, as might be expected, the most resistant to beating.

Bursting Strength.

The development of bursting strength was at first similar for all the bleached pulps. The pulp from the three-stage chlorination method possessed slightly higher final bursting strength than the other pulps, with the pulp from the single-stage chlorination excelling somewhat over that made by the two-stage chlorination. All pulps appeared to be finally about equal to the unbleached pulps.

Tearing Resistance.

The tearing resistance of the pulp from the two-stage chlorination procedure may have exhibited, in general, some small advantage over the pulp from the three-stage chlorination method, and both were better than the product of the single-stage chlorination process. The first two pulps mentioned above were similar to the unbleached pulp.

Folding Endurance.

While the data representing the folding endurance of the pulps were a little more difficult to interpret, pulps from the three-stage chlorination and the single-stage chlorination procedures seemed to exhibit comparable folding endurance during the earlier and later periods of beating, and were superior to the pulp pielded by the two-stage chlorination. The folding endurance of the unbleached pulp developed slowly but the final value (not shown) was about thesame as the maximum indicated.

The small differences between the several pulps pointed out should not obscure the general result that the beating and strength characteristics of the bleached pulps, regardless of the procedure used in bleaching, were quite close to each other and to the unbleached pulp. For practical purposes, no one pulp appeared to hold a consistent and marked advantage over another.

Viscosity.

The viscosity values of the series of sulphate pulps representing the several bleaching procedures paried within the limits of 16.4 to 19.3 cP, a narrow range which indicated little or no practical advantage for any particular method of bleaching with respect to this property.

Brightness.

There appeared to be no significant difference between the final brightness of the pulps from the various bleaching methods. Brightness values for the five pulps in this series were 89.8 for the three-stage chlorination with a second alkali stage after the third chlorination (pulp No. 370B), 88.9 for the three-stage chlorination with recycled liquors in the first

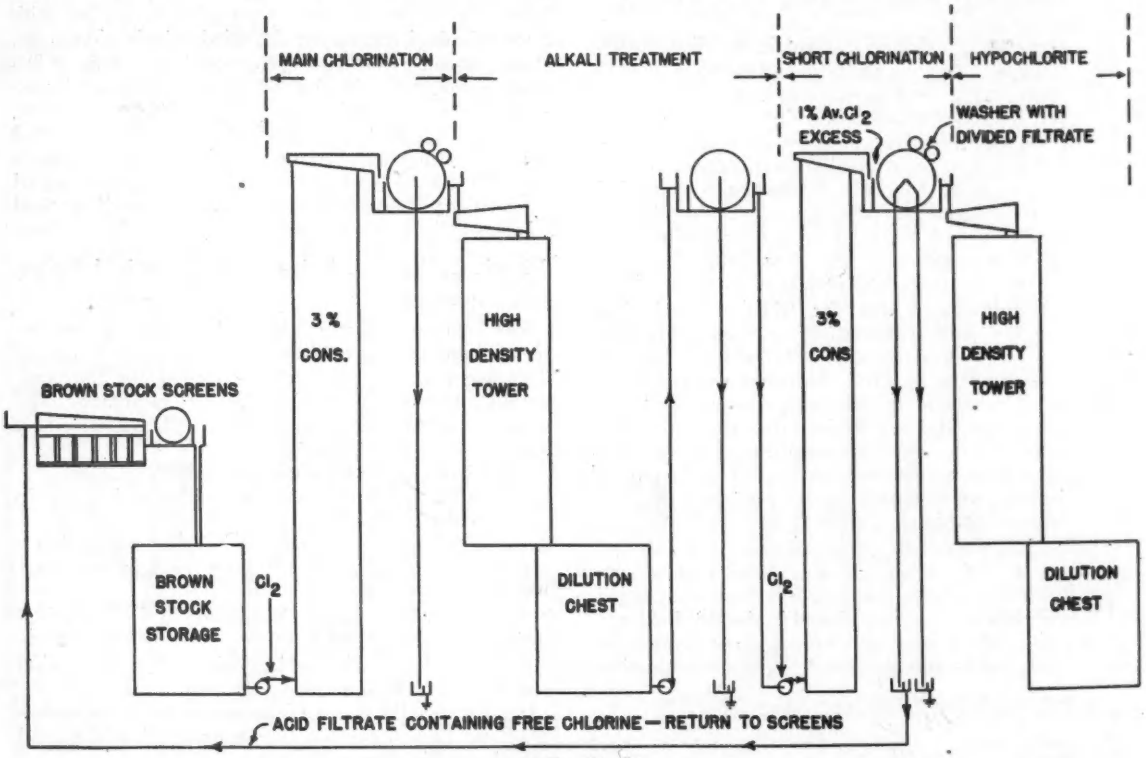

FIG. 14

Proposed Method of Chlorination of Kraft Pulp. Pennsylvania Salt Manufacturing Co.

stage (pulp No. 380A), 88.5 for the single-stage chlorination (pulp No. 360A), 87.4 for the three-stage chlorination with fresh chlorine in the first stage (pulp No. 370A), and 86.7 for the two-stage chlorination. The range of about three points in brightness was not considered sufficiently large to show a decided practical advantage for any method.

Cost of Bleaching Chemicals

The cost of the chemicals consumed in the chlorination, alkali, and hypochlorite stages of the representative sulphate bleaches was calculated with the results presented in Fig. 13. This chart indicated that a saving of $0.68 per ton, or 14.7% of the cost of the chemicals, might be realized when employing a three-stage chlorination process with recycled liquors instead of a single-stage chlorination procedure. The inclusion of a second alkali stage between the second- or third-chlorination stage and the first hypochlorite stage did not appear to be economically advantageous. The two-stage chlorination method was only slightly more expensive than the three-stage chlorination method with recycled liquors, although there were indications that the two-stage chlorination might produce a pulp of somewhat lower brightness.

General Conclusions

These studies have indicated that the chlorination reaction itself appears to be substantially completed in a short time, of the order of 5 minutes, after the initiation of the chlorination stage. A slow reaction then appears to set in during the remainder of the chlorination stage.

That this reaction is of an oxidative character has been suggested especially by the studies of the two-stage chlorination method where the removal of bleachable impurities was accomplished equally well by chlorine or hypochlorite with no marked differences between the viscosity of the resultant pulps. Introduction of suitable quantities of chlorine in the chlorination stage seemed to establish automatically a concentration of hydrogen ions favorable to chlorination.

The solubility of the products of chlorination of sulphate and sulphite pulps in the aqueous acidic medium of chlorination increased in direct proportion to the quantities of chlorine added and approached a maximum at the practical limit of chlorination. Reactions other than chlorination may have been in part responsible for dissolution of these materials. The products from the single-stage chlorination treatment of sulphate pulp proved to be less readily soluble in aqueous acidic medium than those from sulphite pulp.

This has been supported by the results of the studies of the threshold chlorination method. This type of procedure has been successfully applied in a two-stage chlorination method for sulphite pulp, but such a two-stage treatment did not appear to be applicable for the sulphite pulp. It therefore appeared to be important, when dealing with such pulps, to allow sufficient time during the chlorination stage to permit dissolution of the products of reaction, presumably through the slow secondary reaction. This has been substantiated in the three-stage chlorination method as applied to sulphate pulp where the second or main chlorination stage was allowed to proceed to exhaustion to obtain the maximum removal of the bleachable materials commensurate with the amount of chlorine added.

see top of reverse page →

chlorine in addition to that required to render them soluble, as has been demonstrated through the absorption of chlorine by liquors from a sulphite pulp chlorination. Reduction in the amount of bleachable materials removed during chlorination may result from such an action, as has been seen in the superiority of a two-stage over a single-stage chlorination with respect to the chlorine demand of the resultant pulps.

The products of chlorination potentially soluble in alkali have increased in direct proportion to the quantities of chlorine added, but only to an extent corresponding to the point of optimum chlorination. The utilization of a second alkali extraction stage after the second or third-chlorination stage in a multichlorination procedure has been found to exhibit no appreciable effects, in general. These observations suggest that only a certain portion of the bleachable materials may be made potentially alkali soluble by chlorination. Nevertheless, the importance of the alkali extraction stage has been emphasized by the production of pulps of equal chlorine demand by single- or two-stage chlorination when followed by alkali extraction.

This investigation has further indicated that the bleaching of wood pulp may be best accomplished by chlorinating only to an optimum limit which is characteristic of the bleaching procedure employed and is dependent upon the properties of the pulp such as those relating to the cooking procedure and the chlorine demand of the pulp. The limits to which the pulp might be chlorinated by the several bleaching procedures appeared to fall within a narrow range, when integrating the chlorination with the bleaching procedure as a whole.

Chlorination to less than the optimum extent has resulted chiefly in the placement of an undue burden on the hypochlorite stage with consequent tendencies towards degradation through oxidation. Increased use of hypochlorite has also increased the chemical costs. This has been demonstrated by the single-stage chlorination bleaching of sulphate and sulphite pulps, as well as by the realization of economies in charges for chemicals when employing a multichlorination bleaching procedure instead of a single-stage chlorination bleach.

Chlorination beyond the optimum degree has achieved no improvement by itself nor have any potential benefits been realized in the succeeding stages, notably the alkali extraction stage. This has been exemplified by the single-stage chlorination bleaching of sulphate and sulphite pulps where uneconomic operation again resulted from utilization of quantities of chlorine greater than the optima. In a two-stage chlorination bleaching procedure the quantity of chlorine which might be introduced in the second chlorination stage was governed by consideration of the limited extent to which chlorination appeared to progress as well as by such practical factors as operating time and loss of unconsumed chemical. These considerations have been eliminated, however, in the threshold chlorination method embodied in a two-stage chlorination for sulphite and a three-stage chlorination method for sulphate in which chlorine containing liquors are recycled from the last to the first chlorination stage.

Figure 14 shows a typical kraft pulp chlorination flow diagram. The diagram indicates the use of a vacuum type washer which permits the separation of the filtrate into two parts. The primary filtrate from the short chlorination containing the excess chlorine

The soluble products of chlorination consumed is returned to the head-box of the brown stock fine screens where the chlorine is immediately absorbed by the pulp and the acid is used to neutralize the alkali contained in the unbleached fibers.

The overall trend has been toward more effective utilization of chlorine in the multichlorination methods with a limited increase in the extent of chlorination beyond that applied in the single-stage chlorination. The more effective use of chlorine has been reflected primarily in the cost of the chemicals for bleaching of sulphate pulp. This cost has decreased as the amount of elemental chlorine introduced has increased, although the total quantity of chlorine required in the form of chlorine and hypochlorite has remained substantially constant when producing pulps of comparable brightness and physical characteristics.

END

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Kalamazoo TAPPI to Discuss Printing

The April meeting of the Kalamazoo Valley section of TAPPI will be held at the Columbia Hotel on Thursday evening, April 3, at 6:30 p.m. R. Mashburn will preside while H. Ware will be in charge of the program.

The main speaker of the evening will be Harry L. Gage, Vice-president of the Mergenthaler Linotype Company, whose subject will be "Graphic Arts from a Paper Mill Manager's Viewpoint." Mr. Gage will attempt to visualize himself as a paper mill executive and as such will discuss the graphic arts and paper mill data which he considers is of special importance for making managerial decision. He will also describe the procedure he would follow in collecting this data. Mr. Gage is well qualified to talk on this subject because of his broad experience in the printing field. His education started with practical experience in the plant of his father, the well known Fred W. Gage of Battle Creek, Mich., and then continued at the Chicago Arts Institute, Carnegie Institute, Bartlett-Orr Press and finally the Mergenthaler Linotype Company. He has had experience in operation, sales and management of printing concerns and has acquired considerable knowledge of both paper and printing. He has a good understanding of the relationship of the one to the other.

Mr. Gage is a well known lecturer on Graphic Arts, having lectured throughout the country. He has also taken active interest in printing education and library advancement work.

Following the custom of past meetings, there will be a display shown which will be closely related to the general topic of discussion. Of particular interest will be the display of printing and printed materials made up by Elliot of Time Incorporated. Mr. Elliot will talk about his display before the group. V. Vallandingham of the Kelco Company will also be on hand to demonstrate and discuss his smear test for ink penetration, and will be available for questioning on methods for testing paper printability.

It is expected that there will be a lively question period following the talks. This period will be informal in nature and will not stem from prepared questions.

TAPPI Pulpwood Monograph Receives Bouquet

To the Editor, PAPER TRADE JOURNAL

My hat is off to the Technical Association of the Pulp and Paper Industry, to R. G. Macdonald, its Secretary, and Harry F. Lewis of the Institute of Paper Chemistry, for producing TAPPI Monograph No. 4 on Pulpwood Stands, Procurement and Utilization.

I agree that no subject could be of greater importance to an industry than availability of its raw materials in years to come. Our small company cannot make shipping sacks in Wellsburg unless trees are available in sufficient quanity to be economically converted into pulp and kraft paper.

With the object of securing authoritative information on the subject, I looked in vain for just what monograph provides, namely reliable opinions regarding the long term prospects of "trees for tomorrow." I asked a well known consulting firm to provide a report for which I expected to pay substantial consideration, but was advised that they were not particularly well qualified to do so. They referred me to another agency that I had really expected to subsidized in this connection.

Up to the time of the receipt of this volume we have had only such isolated opinions as the one provided by a kraft manufacturer in the South who told us when we asked him why he didn't put in another fourdrinier machine — "We haven't got enough trees." Naturally such an opinion is in direct variance with the thought of those who are currently projecting large investments in new southern papermaking enterprises. It seems to be anybody's guess, but Mr. James W. Cruikshank of the Southeastern Forest Experiment Station has certainly drawn some conclusions that seem to be altogether well founded.

We are obtaining additional copies of the monograph to be ready by the members of our Board of Directors. Let me again compliment those responsible for this valuable addition to the TAPPI literature, proving once again the great value of membership in the Technical Association.

M. J. Davis, President
Hammond Bag & Paper Company
Wellsburg, West Virginia

TAPPI Notes

Robert F. Nelson, formerly price executive for the OPA, is now vice president of the Rhinelander Paper Company, Rhinelander, Wis.

H. C. Fleischer is now managing director of the Swan Mill Paper Company, Ltd., London, England.

Lloyd Carpenter, formerly of the Gilman Paper Company, is now production supervisor for E. W. Twitchell, Inc., Third and Somerset Sts., Philadelphia, Pa.

The TAPPI Ohio Section will meet at the Hotel Manchester, Middletown, Ohio, on Thursday evening, April 10th. There will be around table discussion of consistency regulators.

River Reaeration*

By Averill J. Wiley[1], Leonard Parkinson[2], Harry W. Gehm[3], Theodore F. Wisniewaki[4], and A. F. Bartsch[5]

Abstract

A method suggested by Prof. Tyler of the University of Washington consisting of diffusing compressed air beneath the surface of a river which has been polluted for the purpose of maintaining minimum levels of dissolved oxygen, has been tried in full scale on a Wisconsin river. The experimental set-up consisted of an aerating station located at a power dam downstream from a sulphite mill at a point where a serious sag in dissolved oxygen occurred in the stream during low summer flows. Employing carborundum diffusers with a total area of 319 square feet set at a depth of about 10 feet and fed by a compresser capable of supplying 1550 cubic feet of air per minute at 5 p.s.i. it was possible to add to the stream an average of close to 1.5 tons of oxygen per day at a flow of 880 c.f.s. This together with the immediate satisfaction of a portion of the B.O.D. of the stream water, attributable to aeration, caused a marked movement upstream of the zone of recovery. Hence the process appears to be a useful tool in accelerating the recovery of a polluted stream shortening to a considerable degree the distance of passage required for oxidation of the waste and serves to precent anerobic conditions and attending nuisance.

Extensive test data collected during operation of the unit are summarized in this paper including biological observations with respect to steam flora and fauna. Recommendations with respect to application, requirements, design, and efficiency are included.

The pulp industry, stream sanitation authorities, sportsmen's organizations, and others concerned with stream pollution problems have shown increasing interest in commercial-scale experiments being conducted at Park Falls, Wisconsin for reaeration of the Flambeau River. The principles involved in this method of alleviating the effect of heavy pollution by strong industrial and other wastes having a high concentration of fermentable organic matter were first described by Tyler *(1, 2)* and as applied in experiments here reported have never, so far as is known, been tried outside the laboratory. Basically, the process involves maintenance of minimum levels of dissolved oxygen in dilution waters by mechanical aeration and is believed to be mainly applicable to flowing streams below the point of discharge of pollutants carrying relatively high loadings of biochemical oxygen demand.

Many problems have arisen in the course of the first three years of study, but in spite of troublesome variables encountered, basic information and data are now available which show that mechanical reaeration of streams may be considered as a promising new method of reducing the effect of heavy pollution. In effect, the process accelerates the normal biological rates of reaction naturally occurring in rivers and streams. Compared with processes involving treatment of waste liquors prior to dilution in streams, this process promises advantages in low installed cost and low operating expense.

Whether or not reaeration of streams receiving wastes with high biological oxygen demand can be considered to be a complete treatment process will be dependent a great deal upon local conditions. It can be regarded certainly as an ameliorating measure in stream sanitation.

History and Description of Experiment

Pollution of the Flambeau River by sulphite waste liquor at Park Falls, Wisconsin has been a difficult problem for a number of years. The years having low stream flows have been associated with serious conditions effecting the river far downstream in the resort area round Oxbo some 25 to 30 miles from the source of pollution with resulting complaints and actions from resort owners, sportsmen's organizations, and others concerned. Stream surveys first initiated by the Wisconsin State Board of Health gave preliminary information required and with this as a basis various methods of treating the liquor were proposed and investigated. Ponding of the liquor was studied extensively; but experience elsewhere with seepage and odor nuisances from lagoons combined with the lack of a suitable location for a lagoon weighed against this method. The first practical measure put into effect involved regulation of stream flow from storage reservoirs to give minimum flows of 700 cubic feet per second, and as close as possible to 800 cubic foot per second. By this method, first initiated in 1942, the waste liquor was given the greatest possible degree of dilution with river water on a sustained basis. Flow regulation was found to be of considerable value but critical conditions of low dissolved oxygen levels in the river have prevailed in spite of flow control, and it was early recognized that the available stream flow was insufficient. Dilution alone as a source of dissolved oxygen has been found adequate only in periods of high water when flows approach 2000 cubic foot per second.

Calculation of the quantities of oxygen required to make up the difference between available quantities of dissolved oxygen in the river water and the amount required to maintain desired levels of D.O. in the water led to study of mechanical methods of aerating at one or more points along the river course. After some further study a cooperative research program was initiated, financed jointly by the Flambeau Paper Company and the Sulphite Pulp Manufacturers' Committee on Waste Disposal. Equipment was assembled and first placed in operation in September, 1943 and with subsequent additions and improvements was operated during the summers of 1944 and 1945. The Sulphite Pulp Manufacturers' Committee's rights and interests in the process were purchased by the Na-

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* Presented at the Annual Meeting of the Technical Association of the Pulp & Paper Industry, Hotel Commodore, New York, N. Y., Feb. 25-28, 1946.

* Contributed as a phase of the sulphite waste research program of the National Council for Stream Improvement (of the Pulp, Paper, and Paperboard Industries, Inc.) in cooperation with the following:
The Sulphite Pulp Manufacturers' Committee on Waste Disposal
The Flambeau Paper Company
The Wisconsin State Board of Health
The Wisconsin Committee on Water Pollution
R. G. Tyler of the University of Washington

[1] Sulphite Waste Project, National Council for Stream Improvement, Inc., and Chief Biochemist, Sulphite Pulp Manufacturers' Committee on Waste Disposal.

[2] Technical Superintendent, Flambeau Paper Company, Park Falls, Wis.

[3] Technical Advisor, National Council for Stream Improvement, Inc.

[4] Senior Assistant Sanitary Engineer, Wisconsin State Board of Health.

[5] Senior Biologist, Wisconsin State Board of Health.

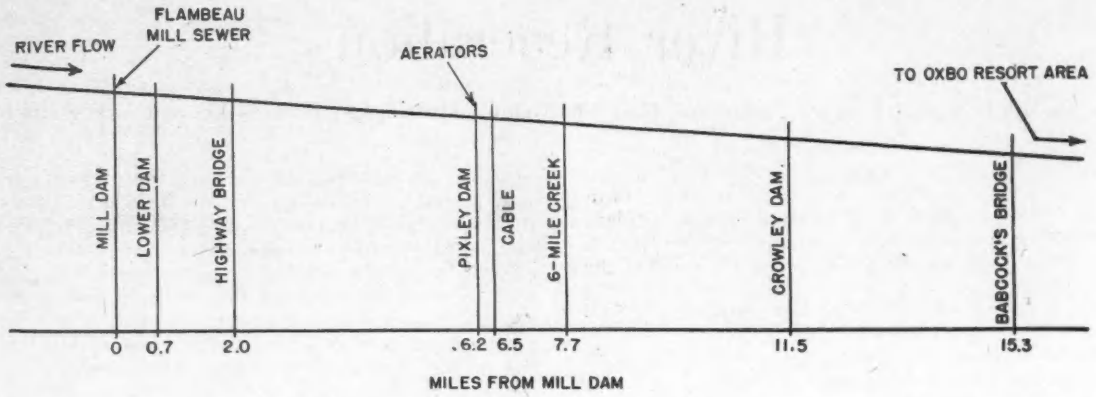

FIG. 1
Sampling Stations at Flambeau River

tional Council for Stream Improvement early in 1945.

The Flambeau River flows in a south westerly direction through the city of Park Falls in the north central section of the State of Wisconsin. Park Falls has a population of around 3000 and its principle industries besides the pulp and paper mill of the Flambeau Paper Company are lumber mills.

There are four hydroelectric power dams along the stretch of river under study with the first located at the paper mill in the city. Sulphite waste liquor from the pulp mill, which produces about 65 tons of sulphite pulp per day, is introduced into the river in a channel just below the mill dam. The city's sewage plant, equipped for activated sludge treatment, has its effluent outlet some 100 yards farther downstream. Samples of unpolluted river water have been taken daily throughout the summer above the mill dam.

A second power plant is located at the lower dam seven-tenths of a mile below the mill dam. Between the pulp mill and the lower dam there was much evidence of sludge bank formation from white water wastes and for a considerable distance the waste liquor seemed to follow a channel in the river bed, but analysis of the water after passing the lower dam showed excellent mixing had taken place. Bottom mud contained some fiber but sludge banks were not in evidence below that point.

Sampling points for analytical work have been established at the highway bridge 2.0 miles downstream from the mill dam, above Pixley dam 6.2 miles downstream from mill dam, at a cable mounted across the river 1500 feet below Pixley dam, and 6.5 miles below the mill dam, at the outlet of the Six-Mile Creek 7.7 miles below the mill dam, at Crowley dam 11.5 miles from the mill dam, and at Babcock's bridge 18.5 miles below mill dam. For sketches showing the sampling points, see Fig. 1. The Oxbo resort area is located 8 miles farther downstream from Babcock's bridge and about 27 miles below the mill dam. Samples have not been collected regularly in the Oxbo area because of the distance.

Description of Aeration Facilities

Aeration facilities are located at the Pixley dam where critical conditions of low dissolved oxygen content have been found to start in the river. Later study may dictate placement of aeration equipment upstream or downstream from this point to achieve more efficient results; but for the studies to date the location at Pixley dam has been very convenient, both from an experimental standpoint and from the standpoint of power and other physical facilities.

A sketch of the present aeration layout at Pixley dam is shown in Fig. 2.

Air is furnished by an Ingersoll-Rand ES-1 compressor located in the generator room of the powerhouse. This 23 × 13 inch machine is driven by a 100-hp. motor but requires less than that amount of power for the 6-pound pressure used, and delivers from 1550 to 1360 cubic feet of air per minute in the pressure range of 5 to 15 p.s.i. The compressor has an excellent capacity and pressure range for experimental purposes, but commercial installations would probably best be equipped with blowers having lower horsepower requirements and capable of delivering varied amounts of air according to particular requirements of stream flow and pollution loading. So far air pressures greater than 6.5 pounds for the hydrostatic head over the aerators as presently installed have not been required.

The original installation of aeration equipment during 1943 and 1944 utilized plate-type diffusion media placed in the tailrace only. Seventy-five 1-inch Carborundum plates 1-foot square were placed in each of two "baskets." These plates were closely matched by the manufacturer and have a permeability rating of from 29.0 to 29.9. The "baskets" were made up of 4 by 7 inch structural angle steel welded to hold five rows of fifteen plates each with each row immediately adjacent to the other, thus forming a bed of plates 5 feet wide and 15 feet long when lying across the floor of each of the two main tailraces used continuously by power units. A third basket with three rows of plates was placed in the tailrace below the third turbine used in periods of high flow when more than the 600-cubic feet per second required by the first two turbines was available. In the fourth tailrace a single row of plates was tried in 1944. This fourth tailrace is not in use at any time, but it was observed that currents in the tailrace beyond the powerhouse swirled into this tailrace and it was thought advantageous to utilize the excess air supply to add more air to that current, and at the same time to take some of the load from the other three sets of plates which were being called upon to deliver as much as 10 cubic feet of air per minute per plate. This was an overload of some five times the recommended capacity of the plates.

It was early observed in the work that the available air supply was not being used efficiently. Even with the rapid current through the tailrace with its cutting action on the diffused air bubbles, there was violent turbulence above the baskets and much evidence of coalescence into large masses of free air rising to the surface. Analysis showed that the used air rising to the surface as discrete bubbles downstream had a much reduced oxygen content, so plans were made and executed for remodeling the baskets and adding more air diffusing equipment above the dam for the year, 1945.

The tailrace aerator baskets were remodeled to give at least two feet spacing between rows, thus extending them back in the tailraces under the powerhouse proper (see Fig. 2). Much improvement was noted as a result of this change.

A different type of equipment recommended and furnished by the Chicago Pump Company was installed in the headrace above the dam early in August, 1945. These were tube-type diffusers mounted in four sections of sixteen tubes each on stationary holders just in front of the racks above the two main turbines. National Carbon and Carborundum - type tubes are both in use on this equipment. The permeability rating is about 30. Both headrace and tailrace aerators are placed 12 feet below the surface of the water.

After placing the headrace units in operation, still more improvement in physical appearance and in the aeration efficiency were noted. This was due to further reduction in the amount of air which each diffuser plate and tube was required to handle. Bubble size decreased in the tailrace units and much less turbulence and coalescence were apparent.

Some concern was felt over the possibility of loss in power efficiency of the turbines as a result of aerating in the headrace and also over the possibility of corrosion of the turbine blades. Actually, almost all, if not all, free air bubbles rise to the surface before entering the turbine intake tube and no adverse effects have been observed.

Methods of Analysis

Standard methods of analysis for D.O., 5-day B.O.D., pH, alkalinity acidity, and oxygen consumed were used routinely. The B.O.D. methods used incorporated the supplemented dilution water of Lea and Nichols and the Winkler method for D.O.

Review of Experimental Data

The first two seasons of experimental work served largely to show up design deficiencies and to work out methods of analysis. So many variables were encountered that it proved difficult at first to assess the value of reaeration, however, sufficiently positive results were obtained to warrant further work. Detailed data are not provided in this paper but were compiled in two reports prepared by Wisniewski *(3, 4)* and in a third report by Wiley, et. al *(5)*.

In 1944 the reaeration equipment was started May 9 and operated for the entire summer except for a July Fourth shutdown. Daily analysis was carried out by the mill analytical staff with determination of D.O., B.O.D., pH, oxygen consumed value, and temperature.

From May 1 to 15, 1944, an intensive analytical survey was run on 2-hour intervals day and night to determine variables concerned with the time interval for wastes to flow from the mill to Crowley dam. This was coordinated with mill production data to show that about 30 hours were required for the effect of an increase in loading at the mill to show up at Pixley dam and an average of 84 hours at Crowley dam when the stream flow was at the approximate average rate of 700 c.f.s.

TABLE I.—FLAMBEAU RIVER SURVEY

Comparison of Averages of Daily B.O.D. Data (in p.p.m.) June, July, and August of 1943, 1944, and 1945

Month	Year	Aeration	Mill	Pixley	6-Mile	Crowley	Babcock's
June	1943	None	2.21	4.44	...	3.26	...
	1944	1 on	2.43	3.73	3.35	2.75	1.41
	1945	None	1.58	6.46	4.78	4.22	3.22
July	1943	None	2.10	4.63	...	2.55	...
	1944	1 on	2.17	5.81	3.76	2.47	1.75
	1945	None	1.85	4.30	...	2.61	2.00
		1 on *	1.24	5.13	...	2.15	1.38
August	1943	None	2.19	6.08	...	3.59	...
	1944	1 on	1.61	4.42	3.12	2.20	1.70
	1945	1 on	1.48	4.64	...	2.17	0.94
		2 on**	.95	4.15	...	2.38	0.94

* Remodeled aerator in tailrace was started July 24, 1945.
** The second set of aerators in the headrace were started August 10, 1945.

As a result of reaeration during 1944 it was possible to demonstrate from daily data that the D.O. at Crowley dam was slightly higher than without reaeration during 1943, and that the B.O.D. was lowered by about 1.5 p.p.m. Where previous work had shown critical conditions to persist at Babcock's bridge there was evidence that with reaeration the stream was recovering from the effects of pollution at this point.

The daily data for 1943 and 1944 were closely analyzed for comparable periods in which similar conditions of stream flow, temperature, and loading were attained with and without reaeration. Calculations based on the comparison indicated that several thousand pounds of B.O.D. were being satisfied by reaeration.

Practical observations on the effect of reaeration in 1944 came in from unsolicited sources. Sportsmen and resort owners reported much improvement in stream conditions in the resort area below the point

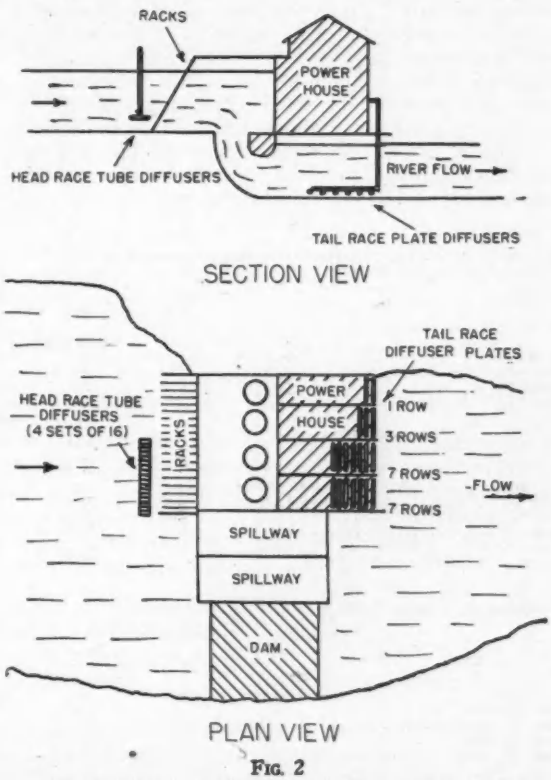

FIG. 2
Sketch of Aeration Facilities at Pixley Dam (Not to Scale)

of reaeration, and catches of walleyed pike were made up to Crowley dam for the first time in many years. Daily analysis was started by members of the Flambeau Paper Company staff June 11, 1945, and was continued through September 8. Special analytical surveys were conducted in addition by staff members of the National Council for Stream Improvement and by Mr. Wisniewski of the Wisconsin State Board of Health for 2-day periods, July 26 and 27, August 9 and 10, and August 23 and 24. Reaeration with remodeled tailrace aerators was started July 24 and with newly added headrace aerators August 10.

Table I reviews a comparison of daily B.O.D. data averaged by months for the three years, 1943, 1944, and 1945. This is a good reflection of the actual condition of the river. Without reaeration and irrespective of river flow conditions, the B.O.D. at Crowley dam averaged above 2.5 p.p.m. With reaeration the B.O.D. averaged well below 2.5 p.p.m. Likewise at Babcock's bridge the available data shows an average B.O.D. of 2 to 3 p.p.m. or more without reaeration, but with reaeration the B.O.D. dropped to the approximate level of the unpolluted river water above the pulp mill denoting nearly completed recovery of the stream.

Because of lack of adequate comparative data it has been difficult to demonstrate the effect of reaeration upon dissolved oxygen levels at various points along the stream as compared to the years before reaeration was attempted. The pollution load on the river, the stream flow, and particularly the oxygen saturation levels of the water all vary, and these factors combined with incomplete data from downstream sampling points prevent any attempt at tabulation. However, it is known that in low water periods, prior to reaeration, the D.O. at the Crowley and at the Babcock sampling points were consistently below a critical level of 2 p.p.m. and have often dropped to a state of complete oxygen depletion. This condition has been known to extend on down the river to Oxbo. Reaeration during low water periods of August, 1944 and 1945, have maintained D.O. averages above 1.5 p.p.m. at Crowley and above 3.3 p.p.m. at Babcock's.

Thus, it can be concluded decisively that the reaeration facilities presently installed have definite accelerative action on recovery of the stream from the effects of pollution and in shortening the stretch of river involved by at least the 8 miles from Oxbo to Babcock's landing. It may prove necessary to add another aeration unit to attain D.O. levels above 2 p.p.m. in the remaining critical stretch of river between Pixley and Crowley dams.

Oxygen consumed data determined daily has been inconclusive so far as can be determined, and it seems improbable that this criterion has much value in the work with river reaeration.

A small drop in pH to a minimum value of 6.4 is noticeable as a result of the disposal of the acid wastes; but the decrease is not considered large enough to seriously affect fish or other biological life and the oxidative reactions occurring as a result of microbiological breakdown of carbohydrates in the liquor do not seem to have further effect upon pH with the river in a reasonably healthy state with reaeration.

The daily data obtained from analysis throughout the summer operating seasons gave valuable information, but the above-mentioned variables in stream flow, etc., which were in a continual state of flux, required additional study. For that reason three intensive 2-day analytical surveys were carried out in July and August of 1945.

It was first necessary to establish reliable and reproducible sampling points along the stretch of river and also across the river section at various depths. It was found that natural surface reaeration caused an appreciable difference in analytical results at various depths and location on the cross-section of the river at sampling stations above the dams. Use of a current flow meter aided in working out sampling systems at such points. The best procedure so far tried involves the averaging of samples taken from several points across the stream section and at depths of two-tenths and eight-tenths of the total depth at each point. Immediately below the dams for distances of at least 0.3 of a mile it was found that a single mid-stream and mid-depth sampling point to give very consistent results. This was accounted for by the excellent mixing action through the powerhouse turbines.

Accurate stream flow measurements were made with the use of a standard current flow meter at 6 to 8 feet intervals across the stream from a boat anchored

TABLE II.—FLAMBEAU RIVER SURVEY (1945)

Calculation of Aeration Efficiency as Based on Increase in D.O. and Compared with Per Cent Saturation of Water Between Pixley Dam and Cable Under Various Conditions of Aeration. (Corrected for Loss or Gain in D.O. Without Aeration)

AERATORS OFF

Date	Discharge	At Pixley, D.O. p.p.m.	At Pixley, D.O. Saturation, %	Below Pixley, D.O. p.p.m.	Below Pixley, D.O. Saturation, %	Loss or Gain in D.O. Without Aeration Between Pixley and Cable p.p.m.	Loss or Gain in D.O. Without Aeration Between Pixley and Cable Pounds/Day
Aug. 9	1,052	3.10	34.5	3.15	35.5	0.05	284 gain
Aug. 24	823	1.93	20.9	1.90	20.6	—0.03	133 loss
Aug. 23	823	1.73	19.2	1.58	17.5	—0.15	667 loss

TAILRACE AERATOR RUNNING

Date	Discharge	At Pixley, D.O. p.p.m.	At Pixley, D.O. Saturation, %	Below Pixley, D.O. p.p.m.	Below Pixley, D.O. Saturation, %	Effect of Aeration as Increase in D.O. p.p.m.	Effect of Aeration as Increase in D.O. Pounds/Day	Effect of Aeration as Increase in D.O. Corrected Pounds/Day	Efficiency of Aeration,* %
July 26	1,073	1.35	15.8	1.79	21.04	0.44	2,550	2,266	5.4
July 27	1,073	1.82	20.48	2.21	24.92	0.39	2,260	1,976	4.8
Aug. 9	1,052	2.81	32.2	3.19	....	0.38	2,160	1,876	4.5
Aug. 10	1,052	3.27	36.14	3.56	38.6	0.29	1,650	1,366	3.3
								Av. 1,871	Av. 4.5

* Based on calculated delivery of 468,568 cubic feet of O_2 per day or 14,600 pounds of O_2 per day by the compressor.

TAILRACE AND HEADRACE AERATORS RUNNING

Date	Discharge	At Pixley, D.O. p.p.m.	At Pixley, D.O. Saturation, %	Below Pixley, D.O. p.p.m.	Below Pixley, D.O. Saturation, %	Effect of Aeration as Increase in D.O. p.p.m.	Effect of Aeration as Increase in D.O. Pounds/Day	Effect of Aeration as Increase in D.O. Corrected Pounds/Day	Efficiency of Aeration, %
Aug. 23 a.m.	823	1.33	14.7	1.93	...	0.60	2,670	3,337	8.0
Aug. 23 p.m.	823	1.78	19.9	2.36	26.5	0.58	2,580	3,247	7.8
Aug. 24 a.m.	823	1.93	20.9	2.47	27.0	0.54	2,400	2,533	6.1
Aug. 10 p.m.	1,052	3.29	36.4	3.76	41.5	0.47	2,670	2,386	5.7
								Av. 2,876	Av. 6.9

to a cross channel cable below Pixley dam. These determinations were found to be very important in evaluating results throughout the experiment.

Chemical and biochemical analysis of numerous samples taken at each sampling point led to reliable data for each condition of reaeration studied.

In Table II are summarized the averages of dissolved oxygen data and that information is used to calculate the aeration efficiency of the equipment installed.

The gain or loss in pounds of dissolved oxygen per day between the dam and cable were first calculated to serve as a correction factor. Data then calculated on the same basis with the tailrace unit alone and with both aeration units operating, showed the effect of increased aeration efficiency.

The table shows that without aeration there was an average reduction of about 205 pounds of dissolved oxygen in the 1500-foot length of the river between the dam and cable per 24 hours. With reaeration from the tailrace unit, a corrected gain averaging 1,871 pounds of dissolved oxygen per day is shown. With both aeration units, the increase amounted to an average of 2,876 pounds of dissolved oxygen and a high value of 3,337 pounds of D.O. per day. Aeration efficiency increased from an average of 4.5% with one unit to an average of 6.9% and a high value of 8.0% with two units.

The effect of water conditions upon aeration efficiency are well demonstrated by comparison of the per cent O_2 saturation of the water with the calculated aeration efficiency for each sampling run. When the O_2 saturation was low at Pixley, the reaeration efficiency was high, with either one or both units, and conversely the higher degrees of saturation led to lower reaeration efficiencies.

Time and lack of facilities did not permit obtaining as much information as desired in regard to the relative merits of headrace and tailrace aeration methods and of tube-type diffusers against plate diffusers. Additional diffusing capacity, air meters, valves, and orifice plates to be installed for the 1946 season will allow better evaluation of these factors.

Some indication may be gained from the data shown in Table II for August 10, however. With the 255 plate diffusers in the tailrace operating alone, an aeration efficiency of 3.3% was obtained, while with the additional diffusion capacity of the 64 tubes in the headrace also operating, and under the same conditions, an efficiency of 5.7% was obtained. The several factors involved in this increase are:

1. Increased diffusion efficiency of each plate or tube through reduction in loading of air delivery per unit. This is still very high, since the rate would run around 5 cubic feet of air per minute per square foot in contrast with the manufacturer's recommendations of from 2.5 to 3 cubic feet per minute per square foot.
2. Relative efficiency of plates versus tubes.
3. Relative efficiency of headrace location versus tailrace location of the diffusing elements.

Biological Survey Data

Additional data for evaluating the effect of reaeration was taken in a biological survey August 9 and 10, 1945, by Dr. Bartsch. His detailed report covering the biota of the river water and bottom muds is appended to the report of Wiley, et al*(5)*.

Samples were collected at fourteen stations shown in Fig. 1 and analyzed in the laboratory to give qualitative and quantitative information on the different types of stream organisms.

Due to the lack of any previous biological surveys from which comparable data could be obtained, it was found difficult to make definite conclusions but certain general trends were noted.

Decreasing total plankton populations were found for some 2 miles above the point of pollution by the sulphite waste liquor and evidence pointed to unfavorable conditions resulting from large masses of coniferous bark and wood steeping in the water. The toxic effect was shown to be increased by the sulphite waste liquor below its point of introduction and plankton populations continued to decrease for some 10.5 miles below the pulp mill.

Immediately below the pulp mill pollution effects were so pronounced as to preclude active growth or life of plant and animal forms other than anaerobic bacteria. This was the only point where anaerobic organisms predominated, however. Sludge worms and *Sphaerotilus* which have been considered by others to be indicators of tolerant pollution conditions were noted as far downstream as Crowley dam. From Crowley dam onward there was evidence of recovery to the normal aerobic condition of the stream.

The biological data obtained are expected to have greatest value when used comparatively with subsequent more extensive surveys which are projected for future work.

Discussion of the Reaeration Process

Further development work on river reaeration methods will in all likelihood extend the possible applications into new fields and increase the efficiency of the process itself. Certain limitations are inherent in the process, however, and these should be recognized in every case where application of reaeration is to be considered.

The designation "reaeration" which Professor R. G. Tyler has assigned to this process in itself delineates one condition. The stream receiving a waste can only be aerated efficiently and practically if the ratio of biological oxygen demand (B.O.D.) to volume of stream flow or other dilution waters is such that the dissolved oxygen (D.O.) content of the receiving waters falls below a certain maximum value, now thought to be around 4 p.p.m. Above such maximum D.O. level, the efficiency of absorption of oxygen in water falls off very rapidly, especially at temperatures above 20°C. Conditions for possible reaeration application are so varied that it is difficult to delineate minimum loadings for maximum efficiency; but the work on this experiment to date would seem to indicate that with sulphite waste liquor a minimum 5-day B.O.D. loading of between 1,000 and 5,000 pounds per 100 cubic feet per second of stream flow is required if reasonable reaeration efficiency is to be expected.

Another condition to application of the reaeration principle is concerned with the time required for microbiological action to take place. The process is believed to be mainly valuable in the treatment of wastes having relatively high concentrations of fermentable organic matter. Biological oxidations or fermentations of such material are dependent upon the presence of microorganisms and the metabolic and enzymatic reactions produced thereby. These are not immediate reactions and a minimum period of time is required for appreciable biological action to take place. In flowing streams having a considerable demand for oxygen by microorganisms this time factor extends over a considerable distance and is dependent on many variables as temperatures, rate of

stream flow, and chemical and physical conditions required for the growth of the microorganisms.

Under the conditions of the experiment here described, it has been learned that several miles of the river immediately below the point of introducing the waste liquor show a lag phase before appreciable microbiological reaction takes place as evidenced by the drop in dissolved oxygen content. In cooler weather the D.O. may remain relatively high for more than 6 miles below the mill sewer, while in warm weather microbiological action is faster and the D.O. without reaeration may drop to zero in less than 6 miles. The main advantage of reaeration of polluted streams lies in decreasing the length of stream involved in the active stage of microbiological oxidation and in maintaining D.O. levels above a safe minimum for the requirements of fish and other normal stream biota.

While much has been accomplished toward evaluation of the reaeration process, there still remains much to be done before optimum conditions and design data can be made available. The process is definitely considered to be still in the experimental stage and further work has been planned and scheduled for another year's activities at the present site of operations downstream from Park Falls, Wisconsin.

Summary and Conclusions

Reaeration of the Flambeau River which had 1945 summer low flows of 720 to 1100 cubic feet per second and a B.O.D. loading from sulphite waste liquor in excess of 40,000 pounds per day, with an amount of air equivalent to about 40,000 pounds per day, showed definite improvement in the condition of the stream. With efficiency of the reaeration equipment in excess of 5% in terms of the ratio of oxygen absorbed to oxygen delivered; the present installation was shown capable of aiding stream recovery to the point of normal 5-day B.O.D. levels at Babcock's landing and to maintain the D.O. at 3 p.p.m. or more at that location some 18 miles from the point of discharge of sulphite waste liquor. A biological survey tended to show that normal aerobic biota of the stream were recovering from the effects of pollution at Crowley dam 11.5 miles from the point of pollution.

The analytical data showing gains in dissolved oxygen content resulting from diffused air reaeration at fractions of 1 p.p.m., reduction in B.O.D. likewise in fractions of 1 p.p.m., and aeration efficiencies of from 3 to 8%, are of greater significance and value than appears at first glance.

Careful consideration will show that the objectives of artificial streams reaeration are:

1. To accelerate microbiological breakdown of fermentable organic matter primarily responsible for the oxygen demand by maintaining minimum levels of D.O.

2. To supply any deficiency in dissolved oxygen resulting from the microbiological oxidations by making up the differences between the total oxygen demand and the oxygen normally supplied by natural reaeration of the water of the stream.

Authorities are not agreed as to what minimum level of dissolved oxygen constitutes a safe factor for normal maintenance and growth of game fish, microbiological life, and other natural hydrobiological fauna. Most agree that a minimum of 2 p.p.m D.O. is absolutely essential and some believe it should be above 3 p.p.m. to allow growth as well as maintenance of life. Considering that the experimental installation as so far developed and installed has raised the minimum D.O. on the river from a frequently observed value of zero to more than 1 p.pm. under conditions studied, it becomes apparent that up to 50% of the desired objective has been attained. Even if the minimum D.O. objective were set at 4 p.p.m., more than 25% satisfaction has been achieved. Because of the fact that absorption efficiency drops off rapidly above 4 p.p.m., it seems unlikely that mechanical reaeration can be effective above that level.

From the above conclusions it is plainly evident that the practical evaluation of river reaeration as a method for treatment of fermentable organic wastes is dependent on:

1. Local conditions determining the degree of waste treatment required.

2. A thorough preliminary survey supervised by competent engineers to determine local conditions of stream flow, B.O.D. loading, degree of natural reaeration, oxygen saturation values, nutrients as N and P necessary in maintaining biological life, and the chemical composition of the waste to be treated.

3. Adequate design based on the above data.

4. Adequate determination of performance and development of standards as a requisite to routine operation.

Where the above factors justify installations, river reaeration will apparently prove to be a new and relatively inexpensive ameliorating measure in connection with methods of waste treatment.

Acknowledgement

Much credit is due the senior author's associates in carrying on the research work here described. Mr. T. F. Wisniewski, Senior Assistant Sanitary Engineer, Wisconsin State Board of Health, has spent much time in assisting with planning and execution of the engineering and analytical phases of the problem. Mr. L. F. Warrick, State Sanitary Engineer, Wisconsin State Board of Health, is to be commended for organizing and bringing together the various organizations and individuals concerned with the project, for over-all supervision, and for suggestions as to methods.

Dr. Harry W. Gehm, Technical Advisor for the National Council for Stream Improvement, has taken an active part in planning and carrying out work during 1945. Professor R. G. Tyler, of the University of Washington, is the patent holder credited with working out the basic principles in the laboratory and has offered many practical suggestions during the course of the work here described. Analytical work of the special surveys was conducted by Mr. B. F. Lueck of the staff of the Sulphite Pulp Manufacturers' Committee on Waste Disposal (of Wisconsin). Dr. A. F. Bartsch, biologist of the Wisconsin State Board of Health, carried out biological studies as a part of the cooperation extended by the State through its Committee on Water Pollution.

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CALENDAR OF COMING EVENTS

March 31-April 1-2, 1947—National Paper Trade Association, Annual Convention, The Waldorf-Astoria, New York City.

April 10-11, 1947—National Paperboard Association, Meeting, Seaview Country Club, Absecon, N. J.

May 18-21, 1947—National Paper Box Association, Annual Convention, Hotel Traymore, Atlantic City, N. J.

May 22-24, 1947—American Pulp and Paper Mill Superintendents Association, Annual Convention, Edgewater Beach Hotel, Chicago.

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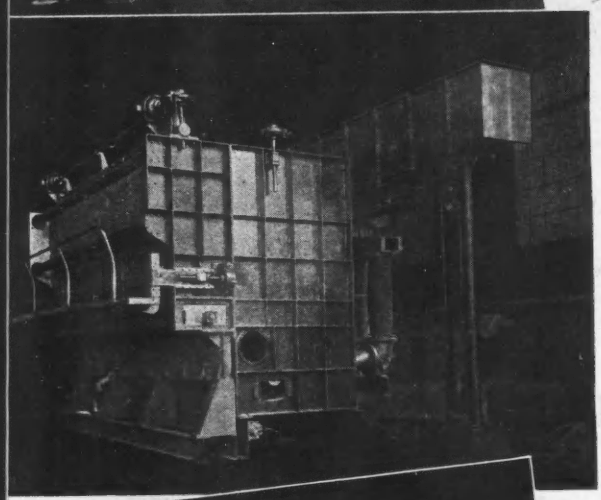

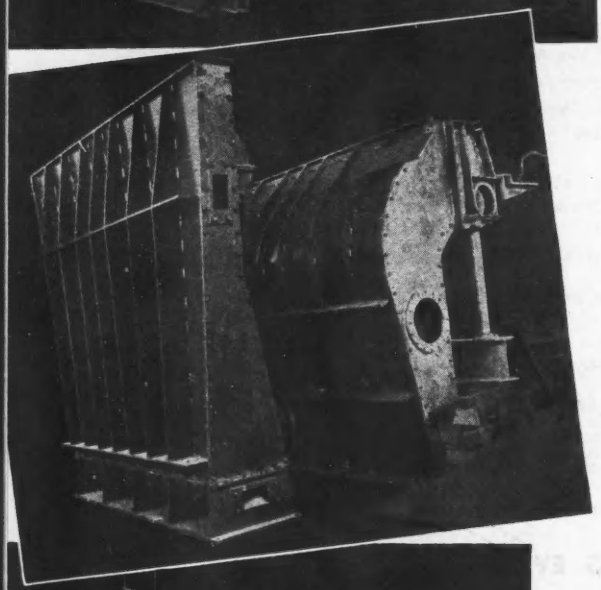

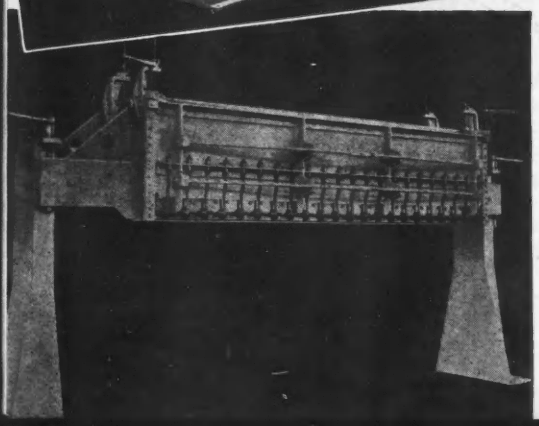

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